BEHAVIORAL OUTCOMES ASSOCIATED WITH EMOTIONAL CONTAGION: A STUDY OF RESTAURANT TIPPING BEHAVIOR

By

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This study examined the effects of individual differences in emotional contagion on applied business outcomes. More specifically, a sample of restaurant servers was selected to determine if the processes of emotional contagion were predictive of evaluative outcomes (e.g., tip percentages and customer satisfaction ratings of their food and service). Servers were asked to complete measures of facial expressivity, emotional receptivity, demographical information, and to monitor their state-affect prior to interacting with each of their tables, as well as the tip percentages left by each dining party. Customers were asked to complete satisfaction ratings of food and service quality, as well as self-reports of post-meal state affect. Results suggested that (a) customers' and servers' moods were congruent, (b) whereas contagion was not demonstrated, customers' moods varied reliably depending on who their server was, (c) servers' levels of facial expressivity were negatively correlated

with customers' moods, (d) server facial expressivity, emotional receptivity, and state affect were not predictive of the tip percentages their customers left them, and (e) whereas customers' state affect was predictive of tipping behavior, customers' state affect did not mediate the relationship between contagion-related variables (expressivity, receptivity, and state affect) and tipping behavior. These results suggest that whereas customers' and servers' moods were related, emotional contagion was not demonstrated to cause this similarity. Furthermore, whereas customers' state affect was associated with evaluative outcomes (i.e., tipping percentages and customers ratings of food and service quality), contagion was not demonstrated to mediate this relationship.

CHAPTER 1
INTRODUCTION

Emotions are important components of human existence because they serve both to channel cognitive perceptions (Bower, 1981; Forgas, 1995) and to motivate approach-withdrawal behavior (Bradley, 2000). Furthermore, peoples' emotions have been demonstrated to be contagious (Hatfield, Cacioppo, & Rapson, 1994). This phenomenon, known as emotional contagion, refers to a three-step process. First, individuals instinctively tend to mimic others' facial expressions. Second, afferent feedback of these mimicked facial expressions is relayed to the brain. Finally, one feels the emotions of another. Doherty (1998) established that the emotions of one individual, transmitted via emotional contagion, have the capacity to alter the cognitions, evaluations, and memories of another in a manner consistent with the mood of the sender. However, there is a paucity of research examining the implications of individual differences in emotional contagion on real-world behavioral outcomes. The purpose of this dissertation is to demonstrate that individual differences in tendency to transmit and receive affect, as well as the valence and intensity of the servers' state affect, have predictable outcomes on the percentage of tips received by servers.

Darwin (1872/1965) claimed that the face is the universal display site of affective states, allowing others to know an individual's emotional state. Ekman and Freisen (1975) subsequently determined that there are six universal facial expressions

existing in similar forms across all cultures (surprise, disgust, sadness, anger, fear, and happiness). Furthermore, humans have inherited the capacity to mimic the facial expressions of others (Izard, 1977). This mimicry is often visible. More commonly however, the mimicry occurs on a sub-visual level (Dimberg, 1987).

Lunqvist (1995) investigated facial mimicry utilizing electromyography (EMG) and found mimicry to be pervasive and nearly instantaneous, occurring in students on an average of 21 milliseconds after being presented with facial expressions of emotion. Further support for the belief that emotional contagion is an essential form of communication is found in newborn infants, who instinctively engage in mimicry and emotional communication long before they are able to communicate verbally (Maltesta & Haviland, 1982). In summary, universally similar facial expressions are automatically and innately mimicked, suggesting that facial mimicry is the first step in a pervasive and primitive form of affective interpersonal communication known as emotional contagion.

Mimicry alone is insufficient for emotional contagion to occur. Afferent facial feedback is the second process required for emotional contagion. Hatfield, Cacioppo, and Rapson (1993) indicated that afferent feedback refers to an individual making "inferences about their own emotional states on the basis of their own expressive behavior" (p. 97). The facial feedback hypothesis asserts that unconscious processing of facial patterns of autonomic nervous system activation impacts individuals' affective states. The relevant research indicates that emotions are, to some extent, influenced by facial feedback (e.g., Kleinke & Walton, 1982; Laird, 1984; Laird, Wagener, Halal, & Szegda, 1982; Schacter & Singer, 1962; see Hatfield et al., 1994 for a review of this literature). For example, Strack, Martin, and Stepper (1988) found that emotional attributions were shaped, in part,

by changes in one's facial musculature. Participants held a pen either with their teeth, thereby approximating a smile, or with their lips pursed in a manner similar to the muscular activity employed in a frown. Concurrently, participants were asked to rate the likability of Far Side comics. Induced smiles resulted in higher ratings of the comics, whereas frowns resulted in lower ratings. Thus, there is evidence supporting the final step of the emotional contagion process, that subjective emotional experience is influenced by afferent feedback from facial mimicry.

All people are not equally affected by afferent facial feedback. Laird, Alibozak, Davainis, Deignan, Fontanella, Hong, Levy, and Pacheco (1994) investigated the tendency for one's subjective state to be influenced by one's facial expressions. Those individuals who adopted a facial expression and in turn tended to feel the emotion they were displaying were labeled as high in cue responsivity. Those who tended to feel less in accordance with the displayed emotions were labeled low in cue responsivity. Thus, cue responsivity can be viewed as an index of susceptibility to afferent feedback.

The connection between emotional contagion and cue responsiveness has been supported by Laird et al. (1994). First, Laird and colleagues determined level of cue responsivity (high/low). They then asked subjects to view video clips of individuals who were smiling. Individuals forced to inhibit their natural facial expressions in response to the video clips reported feeling significantly less happy than those whose natural facial expressions were not inhibited. However, this effect was only found in individuals who were high in cue responsivity, whereas those who were low in cue responsivity tended to rate their levels of happiness similarly, regardless of whether or not their facial expressions were inhibited. In summary, degree of cue responsivity distinguishes

between people who are highly affected by afferent feedback, and in turn emotional contagion, and those who are less so. Whereas the method of determining susceptibility to afferent feedback utilized by Laird et al. (1994) is cumbersome and time consuming, a brief paper-and-pencil measure exists, providing an efficient alternative for determining one's level of cue responsivity. The Emotional Contagion Scale (ECS; Doherty, 1997) is a 15-item self report inventory assessing individuals' susceptibility to contagion via afferent feedback resulting from mimicry of another's emotional expressions.

The research literature suggests important implications for individuals who tend to be high in emotional receptivity (e.g., highly cue responsive). Bower's (1981) associative network theory of emotion provides an empirically supported explanation of the effects of emotion on cognition. In a series of landmark studies, Bower (1981) demonstrated that emotions influence cognitive events, such as social perceptions and snap judgments about another's personality, in a mood congruent fashion. Thus, if one is in a good mood, he or she will tend to evaluate individuals and situations favorably. Bower (1981) claimed that "emotion serves as a memory unit that can enter into associations with coincident events. Activation of this emotion unit aids retrieval of events . . . and primes perceptual categorization" (p. 142). Interpersonal interactions are often ambiguous events, the objective meanings of which are not readily apparent. Bower's work suggested that one's mood influences one's interpretation of interpersonal events, particularly in ambiguous situations. Furthermore, Bower suggested that mood influences the manner in which people elaborate on or draw inferences from interpersonal events and that their expectations are positive or negative, depending on their mood. How does Bower's theory relate to emotional contagion? Hypothetically, when one "catches"

the mood of another it should influence the person's memory, cognitions, and perceptions in a manner congruent with the mood of the affective sender.

Doherty (1998) investigated the relationship and implications of another's emotional expression on one's cognitive processes, while taking into account individual differences in responsiveness to afferent feedback. Attention, evaluative ratings, and recall all evidenced a bias reflecting the emotional sender's mood. Doherty's (1998) findings suggest that exposure to even mild and transient emotional expressions of another can influence cognition and behavior. Furthermore, Doherty demonstrated that this effect was greater for those who are more sensitive to afferent feedback (i.e., those individuals who are highly cue responsive).

Taken together, Doherty's (1998) and Bower's (1981) research suggests that the affect, cognition, and behavior of high ECS scorers will be directly influenced by another person's affect, through the processes of emotional contagion. However, individuals vary in the degree to which they influence the affect of these highly cue responsive people. Although this issue will be examined in more detail in Chapter 2, the single most important characteristic of an effective transmitter of emotion is one's level of emotional expressivity. One must express emotions if another is to mimic these emotions. Klein and Cacioppo's Facial Expressivity Scale (FES; 1993) is a brief paper-and-pencil measure of one's tendency to display mimickable emotion or "the degree to which individuals tend to wear their emotions on their sleeve" (Hatfield et al., 1994, p. 149). Thus the construct of emotional receptivity and emotional expressivity are both easily assessed by paper-and-pencil measures.

Despite the pervasive and innate nature of emotional contagion, no studies were found that examined the phenomenon within real dyadic communication among people in naturally occurring interactions. This significant oversight leaves unaddressed a host of important issues, primary among which are the extent and effect of emotional contagion in real-world interactions. Instead, the majority of emotional contagion studies have focused on verifying the presence of emotional contagion in artificial, laboratory settings. There is substantial value (i.e., prediction and control) to laboratory experiments focused on understanding and manipulating processes involved in emotional contagion. However, unless the phenomenon is demonstrated to be of real-world importance, studies on emotional contagion will likely be viewed with only guarded interest. The published research to date does not permit a determination of the extent to which this primitive form of emotional communication operates in such real-life contexts as business negotiations, therapeutic interactions and marital interactions.

The research literature reflects only an initial level of understanding regarding the role of emotional contagion in business contexts. No studies were located addressing whether or not emotional contagion tends to be present in face-to-face business interactions. Whereas one could expect fiscally important implications for emotional contagion in business settings, studies have not yet demonstrated emotional contagion's presence or importance in applied settings. However, research by Verbeke (1997) has suggested that contagion-related variables (e.g., individual differences in emotional transmission and receptivity) do indeed play significant roles in sales performance. Verbeke (1997) demonstrated that highly receptive salespeople (i.e., high ECS scores) demonstrated both higher sales totals and higher levels of employee burnout than

salespeople low in their degree of receptivity. It is intriguing that receptivity, not emotional expressivity, was associated with increased sales performance. Perhaps the reason emotional expressivity was not associated with sales performance is that Verbeke made no distinction between those who expressed positive affect and those who expressed negative affect. A reasonable assumption is that individuals who infect others with positive affect will have more favorable business outcomes than those who infect others with negative emotions. The literature, however, has not examined the presence of differential business outcomes based upon the valence of affect expressed in conjunction with individuals' level of emotionally expressivity and transmission.

The current study was designed to address both of these gaps in the literature by examining the effects of emotional contagion on the performance of restaurant servers. Restaurant servers were selected because they provide a service for which affect is not essential. Tip percentages and customer satisfaction ratings of food and service constituted the primary dependent measures. These measures directly address the central question of this study, which is: Do individual differences in receptivity to another's affect, degree of mimickable affect emitted, and the valence and intensity of an individual's state and trait affect lead to predictable evaluative outcomes? Another factor that makes tipping an especially appropriate dependent measure is that, unlike most business exchanges, the specific monetary value of the service is not predetermined. Instead, the tip amount is left to the customer's judgment. As a result, tipping constitutes an excellent real-world setting in which to examine the external validity of emotional contagion theory. The research literature suggests that customers' affect will influence indicators of satisfaction, such as tip percentages and customer satisfaction ratings. In

fact, some evidence suggests that affective and interpersonal influences can affect customer satisfaction ratings more than the actual quality of the service provided (i.e., Cunningham, 1979).

The belief that the transmission of positive affect from servers to customers will result in increased tip percentages is based on one crucial assumption, namely, that tipping behavior is itself related to the customer's emotional state. In other words, in order to yield the predicted outcomes, it must be demonstrated that customers in more positive moods leave better tips than those in negative moods. Whereas a host of studies on tipping behavior suggest this is likely to be true (i.e., Cunningham, 1979; Rind, 1996; Tidd & Lockard, 1978; and Lynn & Mynier, 1993), none have directly addressed the question.

Three hypotheses will be tested in this study. The first hypothesis predicts that emotional contagion will be evident between servers and their customers. The presence of emotional contagion will be determined by the degree of similarity between restaurant servers' pre-interactional state affect and their customers' state affect at the conclusion of their dining experience. Hypothesis 2 predicts an interaction between degree of facial expressivity, as measured by Klein and Cacioppo's (1993) FES, degree of emotional receptivity, as assessed by Doherty's (1997) ECS, and state affect, as measured by Lang's Self Assessment Manikin (SAM, 1980), such that higher facial expressivity, higher emotional receptivity, and more positive state affect will all be associated with higher tip percentages (see Table 1 for examples of the predictions of this interaction). Table 1 provides a simplified version of the predictions, as facial expressivity, emotional receptivity, and state affect are continuous variables. Finally, Hypothesis 3 predicts that

customer affect will mediate the relationship between contagion and tipping behavior. In other words, when customer state affect is statistically controlled, the statistically significant effect predicted in Hypothesis 2 will drop to non-significance. See Table 2 for a simplified, visual representation of Hypothesis 3.

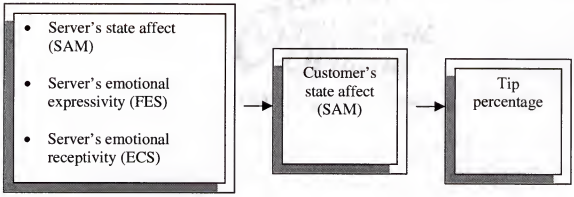
Table 1.

Simplified predictions regarding the expected relationship between servers' reported levels on contagion variables and their relative tip percentage rankings

Levels of Emotional Expressivity (i.e., FES scores) and Emotional Receptivity (i.e, ECS scores)	Valence of State Affect	Servers' Mean Tip % Rank
High FES, high ECS	Positive State Affect	1
Low FES, high ECS	Positive State Affect	2.5
High FES, low ECS	Positive State Affect	2.5
Low FES, low ECS	Positive State Affect	4.5
Low FES, high ECS	Negative State Affect	4.5
High FES, high ECS	Negative State Affect	6.5
Low FES, Low ECS	Negative State Affect	6.5
High FES, low ECS	Negative State Affect	8

Table 2.

Hypothesis 3: Customers' state affect is the mediating link between servers' scores on the 3 hypothesized contagion-related predictors, and tip percentage



CHAPTER 2
LITERATURE REVIEW

This literature review will first report the findings regarding the three component processes of the contagion process (e.g., mimicry, feedback, and contagion). Because a sizable portion of the literature addresses the teleological importance of contagion as a primitive form of communication, the construct of emotional contagion will be discussed within an evolutionary framework. Next, this review will examine the relationship between emotional contagion and the distinct, yet related, construct of empathy. The review of the association between empathy and emotional contagion will lead into a review of variables that mediate the likelihood of emotional contagion. This literature review will then address studies that have examined both the presence and sequelae of emotional contagion in two applied industries (health care and business). Additionally, critiques of and future research directions for contagion-related research will be discussed. The literature review will conclude with a summary of important findings and controversies within the contagion literature.

This literature review was based on a PsycINFO (1887-to 7/2000) search on the phrase "emotional contagion." The search yielded 64 hits on the phrase "emotional contagion." Of the 64 hits, 9 were dissertation abstracts, and 15 others included only passing reference to the concept of emotional contagion. This left 40 articles or chapters that either consisted of empirical research on emotional contagion

and its related processes, or consisted of considerable discussion of the emotional contagion phenomenon. These 40 articles constitute the scientific literature reviewed here.

The Component Processes of Emotional Contagion: Mimicry, Feedback, and Contagion

As previously discussed in Chapter 1, the concept of emotional contagion refers to a three-step process whereby individuals come to feel the emotions of those around them. First, individuals instinctively tend to mimic others' facial expressions. Second, afferent feedback of these mimicked facial expressions is relayed to the brain. Finally, one feels the emotions of another (Hatfield et al. 1994). As the validity of emotional contagion depends on the veracity of these component processes, a large percentage of the contagion literature is devoted to examining these psychophysiological processes in controlled laboratory settings. These studies have generally demonstrated both that mimicry is pervasive, and that moment-to-moment changes in facial expressions are sometimes predictive of self-reports of emotional states. However, no current methodology has unilaterally demonstrated that subjective emotional state is indeed influenced via afferent feedback.

Mimicry. Charles Darwin (1872/1965) provided an anecdotal account of mimicry. Darwin watched his 6-month old son's nurse pretend to cry. His son also saw this and also adopted a sad expression. "I saw that his face instantly assumed a melancholic expression, with the corners of his mouth strongly depressed; now this child could have rarely seen another child crying, and I should strongly doubt whether at so early an age he could have reasoned on the subject" (p. 75). This anecdote is

representative of the mimicry literature, which indicates that humans innately tend to mimic facial expressions at birth (e.g., Field, Woodson, Greenberg, & Cohen, 1983; Levenson & Ruef, 1997; and Malatesta & Haviland, 1982). Levenson and Reuf (1997) indicated that at birth, human babies are sufficiently able to communicate to others how they feel (in large part through facial expressions). Furthermore, infants appear to be naturally predisposed to understand and communicate the differences between pleasure and displeasure. In summary, Levenson and Reuf's findings suggest that infants are "hard-wired" with an ability to nonverbally and noncognitively transmit and receive appetitive and aversive states.

Mimicry is not limited to facial expressions. A body of literature suggests that human beings naturally tend to be in synchrony with one another across a variety of affective domains, including facial expressions (Lundqvist, 1995), autonomic nervous system (ANS) activation (DiMascio, Boyd, & Greenblatt 1957), and subjective reports of emotional states (Totterdell, Kellet, Teuchmann, & Briner, 1998). For example, DiMascio et al. (1955) examined the relationship between therapist and client ANS activation levels. Dyads' heart rates frequently varied together; however, during situations when clients expressed "antagonism" toward their therapists, their heart rates varied inversely with one another. In fact, ANS synchrony has been demonstrated between strangers, roommates, and married couples (i.e., Gottman & Levenson, 1985; and Levenson & Reuf, 1997).

Numerous studies have demonstrated that facial expressions are automatically and unconsciously mimicked. A complete review of this literature is beyond the scope of this review (for a review of the mimicry literature, see Dimberg, 1990). The current literature

review will focus on several studies that have demonstrated facial mimicry to be a pervasive and instantaneous process. The review of these studies is intended to provide a clearer understanding of mimicry, a process that is fundamental to the emotional contagion hypothesis.

Dimberg and Thunberg (1998) examined the speed at which emotion-specific facial electromyographic (EMG) patterns are elicited after exposure to a photograph of either a happy or an angry facial expression. The authors conducted a series of three experiments, from which they determined that affect-specific facial EMG activation patterns were associated with viewing the corresponding facial expressions of emotion. More specifically, increased Zygomaticus activity was demonstrated when individuals viewed happy stimuli (i.e., photographs of smiling faces). The Zygomatic muscle serves to elevate one's lips to form a smile. Conversely, increased levels of Corrugator supercilii EMG activity were demonstrated in response to viewing photographs of angry faces. The Corrugator muscle functions by knitting the eyebrows in frowning expressions. Furthermore, the findings of this study indicated that "differences in [facial EMG patterns caused by] responding to happy and angry faces occurred as early as 300 - 400 ms after stimulus onset" (p. 42). This finding suggests that rapid, emotion-specific facial reaction is a general phenomenon when people are exposed to happy and angry facial expressions. The authors indicated that the importance of this finding "is not that muscle responses, in general, are rapidly evoked, but rather that distinguished facial muscle reactions are spontaneously evoked in…emotion relevant facial muscles when people are exposed to negative and positive emotional stimuli. Consequently, these data rather uniquely demonstrate that different emotional reactions are relatively rapidly manifested as

distinguished bodily responses as early as after a few hundred ms of exposure" (p. 44). In summary, Dimberg and Thunberg (1998) demonstrated that facial mimicry of positive and negative expressions is both spontaneous and rapid.

Dimberg, Thunberg, and Elmehed (2000) indicated that "a critical characteristic of an automatic reaction (besides being spontaneous and rapid) is that it can occur without attention or conscious awareness" (p. 88). Dimberg et al. (2000) conducted a study on facial mimicry to determine if mood-specific facial EMG patterns were elicited even when individuals were unconsciously exposed to happy or sad faces. Dimberg et al. (2000) utilized the backward masking technique to prevent participants from consciously perceiving 30 ms exposures of happy, neutral, or angry target faces. One hundred and twenty participants were randomly assigned to one of three groups (happy-neutral, neutral-neutral, or angry-neutral). For example, individuals in the happy-neutral group were presented with photographs of happy faces for 30 ms (which is too brief a time for conscious cognitive processing), and then they were exposed to a photograph of a neutral expression of affect. Despite the fact that the participants were not consciously aware of having seen happy or angry faces, the different groups responded with distinct facial EMG patterns that corresponded to the happy and angry stimuli (Dimberg et al., 2000). Individuals in the happy-neutral condition displayed increased Zygomatic muscle reactions. The neutral-neutral group displayed an intermediate Zygomatic response, whereas the angry-neutral group displayed the lowest Zygomatic muscle reaction. Conversely, during the first 500 ms after exposure to the photographs, all individuals displayed heightened Corrugator supercilii muscle activity. However, between 500 ms and 1000 ms, the happy-neutral group responded with significantly lower Corrugator

activity than did the angry-neutral group. These results suggest that both positive and negative emotional reactions can be evoked unconsciously (Dimberg et al., 2000). Furthermore, Dimberg et al. (2000) indicated that "the present results support the proposition that important aspects of emotional face-to-face communication can occur on an unconscious level" (p. 88).

Dimberg and Thunberg (2000) examined gender differences in facial reactions to fear-relevant stimuli. More specifically, they examined if females tended to be more facially reactive than males, or if they generally exhibited a greater overall emotional reactivity than did males. Dimberg and Thunberg (2000) exposed 48 males and 48 females to photographs of fear-relevant stimuli (i.e., snakes), and fear-irrelevant stimuli (i.e., flowers). Females displayed greater Corrugator EMG responses than did males. However, there was no significant difference between males' and females' galvanic skin responses and ratings of unpleasantness. These results suggest that females tend to be more facially reactive than males. However, the results do not support the hypothesis that females exhibit an overall greater emotional reactivity than do males. This study is relevant to emotional contagion because it suggests that females are more likely to mimic, and thus to be more emotionally receptive than males, a finding that has been supported by Doherty (1997).

In summary, the research literature clearly and consistently demonstrates that facial expressions are automatically, rapidly, and unconsciously mimicked. Thus, the phenomenon of facial mimicry is well supported. As Levenson (1996) stated, "The mirroring of facial musculature activity . . . is an important component of a widespread interpersonal physiological synchrony, which includes ANS activation, and which

appears to be an integral feature of the transmission of emotion and of emotional information between [individuals]" (p. 197).

Feedback. Mimicry constitutes one of the three components of emotional contagion. The emotional contagion hypothesis predicts that immediately after one person mimics the facial expression of another, afferent feedback will be relayed automatically to cortical processing centers. Afferent feedback has been the most contested of the three component processes of contagion. Those who question the validity of the emotional contagion process tend to argue that insufficient methodologies exist to demonstrate conclusively that afferent feedback is the process that produces emotional congruence. Whereas detractors generally tend to accept that facial mimicry exists and serves a communicative value, they debate the role facial expressions play in the formation and modulation of one's current subjective state.

William James was a central early proponent of the tenet that facial expressions could modulate emotional state. James (1890/1922) believed that a one-to-one linkage existed between basic emotions and internal ANS activation patterns. This now debunked feedback hypothesis asserted that by attending to their behavior and ANS activation patterns, individuals come to infer their feelings. Research on the feedback hypothesis (e.g., Bradley, 2000) has failed to demonstrate the one-to-one linkage of ANS arousal and discrete affective states posited by James. However, a body of research has demonstrated that, in some conditions, afferent feedback can modulate subjective emotional states (e.g., Kleinke &Walton, 1982; Larsen, Kasimatis, & Frey, 1992; Laird, 1984; Laird et al., 1982; Strack et al., 1988; see Hatfield et al., 1994 for a review of this literature).

Both Laird (1974) and Buck (1980) provided revised versions of James's feedback hypothesis, collectively known as the facial feedback hypothesis. Laird (1974) and Buck (1980) both posited that "when facial muscles move, they produce afferent feedback, which plays a primary causal role in the generation and shaping of emotion" (Buck, 1980; p. 200). Thus, the facial feedback hypothesis differs from James's hypothesis in two ways. First, it focuses exclusively on the relationship between facial expressions and state affect, rather than the wide range of possible physiological activation patterns and state affect. Second, the facial feedback hypothesis does not predict a one-to-one linkage between specific facial expressions and emotional states. Instead the facial feedback hypothesis suggests only that modulation of facial expressions can result in somewhat predictable modulation of subjective mood states.

Many of the studies demonstrating that afferent feedback influences ANS activation levels and, in turn, subjective emotional states, must be regarded with some degree of skepticism. These studies asked participants to adopt a certain facial expression and then to indicate their affective state (Levenson & Reuf, 1997). For example, participants may be asked to adopt a frown or a smile and then to indicate their subjective mood state. Clearly, cognitive priming and experimenter demand characteristics cannot be discounted in studies using this methodology (Levenson & Reuf, 1997). However, a subgroup of studies (e.g., Larsen et al. 1992; and Strack et al. 1988) used less problematic methods in determining the role of facial expressions in the formation and modulation of subjective mood states. Strack et al., (1988) provided a more valid study which demonstrated that emotional attributions were shaped, in part, by changes in one's facial EMG patterns. Participants held a pen either with their teeth, thereby approximating a

smile, or with their lips pursed in a manner similar to the muscular activity employed in a frown. Concurrently, participants were asked to rate the likability of several Far Side comics. The induced-smile condition resulted in higher ratings of the comics, whereas the induced-frown condition resulted in lower ratings. Thus, there is evidence supporting the final step of the emotional contagion process, that subjective emotional experience is influenced by afferent feedback from facial mimicry.

Similarly, Larsen et al., (1992) persuasively demonstrated that facial feedback influences one's current subjective state. Golf tees were attached to participants' foreheads and cheeks. Participants were then asked to use their facial muscles to bring the tees on their foreheads closer together (thereby approximating the EMG patterns employed in a frown), or to elevate the tees on their cheeks (thereby approximating a smile), and then rate their subjective mood states. Results indicated that individuals' subjective mood states were influenced by facial musculature patterns in the expected directions, such that individuals in the former condition reported more negative mood states, whereas in the latter condition they reported more positive mood states. Levenson (1996) reflected on the theoretical significance of these findings by stating that "Facial expression may not be simply a social signal, but [it] may also provide a means for establishing mutual feeling, thereby playing a role in the establishment of empathy, attachment, and bonding" (p. 382).

Lundqvist and Dimberg (1995) examined whether activation of specific facial musculature patterns corresponded with specific emotions. Participants were exposed to pictures of individuals expressing sadness, fear, anger, surprise, disgust, happiness, and neutral facial expressions. Viewing different facial expressions (e.g., anger or happiness)

resulted in distinct facial EMG activation patterns, suggesting that each emotion has a characteristic EMG pattern. More specifically, happy faces resulted in more Zygomatic muscle activity, whereas angry faces resulted in more Corrugator muscle activity. To some extent, individuals both mimicked the facial expressions they saw and also came to experience the corresponding emotions. However, not all of Lundqvist and Dimberg's (1995) psychophysiological results were in accordance with the emotional contagion hypothesis. Photographs of angry faces tended to evoke increased subjective reports of disgust and fear in viewers. Lundqvist and Dimberg (1995) suggested that these findings seem to indicate a reactive response (e.g., angry faces evoking disgust and fear) more than they reflected emotional contagion (p. 209). In summary, Lundqvist and Dimberg's (1995) research indicated that certain facial musculature patterns appeared to be causally related to specific emotional states. However, the authors also demonstrated that photographs of angry faces yielded distinct and apparently reactive emotional states. This apparent plasticity in emotional response patterns to mimicry will be discussed in greater detail later in this literature review.

Further support for the ability of facial expressions to alter moment-to-moment mood states is provided by Hess, Kappas, McHugo, Lanzetta, and Kleck (1992) and by Lanzetta, Cartwright-Smith, and Kleck (1976). Hess et al. (1992) compared the time it took individuals to reach one of four emotional states across three experimental conditions. In the "Feel" condition, individuals were asked to internally generate a specific emotion. In the "Feel-and-Show" condition, individuals were asked to internally generate a specific emotion and to express it facially. Finally, in the "Show" condition, individuals were simply asked to make a specific facial expression of emotion.

Individuals were able to internally generate specific moods faster in the "Feel-and-Show" condition than in the "Feel" condition, suggesting that facial expressions may amplify mood states.

Similarly, Lanzetta et al. (1976) demonstrated a connection between facial expressions, ANS activation, and subjective reports of state affect. Participants were asked either to inhibit or to exaggerate their facial expressions to a mild electrical shock. Inhibition of facial expressions resulted in reduced ANS reaction to shock, as well as diminished self-reported pain. Thus, several studies support the hypothesis that facial expressions do indeed influence subjective reports of mood states.

Despite the numerous studies demonstrating the linkage between facial expressions, ANS activation, and subjective reports of emotional state, Lundqvist and Dimberg (1995), as well as Levenson (1996), both indicated that no study directly confirms or refutes the view that afferent feedback from facial expressions influences subjective mood state. Both have argued that afferent feedback is currently only one of numerous competing hypotheses. However, regardless of the mechanism (i.e., facial feedback hypothesis), the research literature demonstrates a link between subjective emotional states and facial expressions.

In summary, mimicry and emotional synchrony are clearly supported in the relevant literature bases. However, critics of the emotional contagion hypothesis dispute that afferent feedback links mimicry and affective state. Until a method is identified to address this issue, one cannot conclusively conclude that afferent feedback mediates the connection between mimicry and emotional congruence among individuals. Given the state of the literature, it is premature to state that the process linking facial expressions

and subjective reports of emotion is afferent feedback. For purposes of the current study, this lack of conclusive empirical support is of greater theoretical concern than practical concern, as prior research has demonstrated that facial expressions do predictably influence subjective reports of emotion. In other words, regardless of the specific mediating variable, the aforementioned emotional contagion effect has been demonstrated repeatedly.

Cue Responsivity as an Individual Difference Variable

As previously reported in Chapter 1, the degree of linkage between facial expressions and affective states varies across individuals, with some individuals demonstrating more physiological linkage than others. Laird et al. (1994) conducted two related studies in order to determine the degree to which afferent feedback exists as an individual difference variable. First, Laird and colleagues asked participants to adopt certain facial expressions of emotion. Those participants who reported feeling the emotions they were posing were labeled as being high in cue responsiveness, whereas those who did not feel the corresponding emotions were labeled as low in cue responsivity. In the second study, participants watched several video clips of people expressing happiness. At times, individuals were forced to inhibit their facial expressions by adopting certain facial expressions. During these trials participants reported feeling significantly less happy than when they were allowed to express their facial affect freely. However, this effect was only found in those individuals who were previously determined to be more cue-responsive. These findings are consistent with the emotional contagion hypothesis (Hatfield et al., 1993) in that highly cue responsive individuals tend to demonstrate a higher degree of linkage between facial expressions and emotions than

do individuals who are low in cue responsiveness. Research conducted by Laird et al. (1994) indicated that those individuals who are low in cue responsiveness tended to utilize situational cues in determining their subjective states. Thus, emotional contagion can be expected to a greater degree in individuals who are high (vs. low) in cue responsivity.

Doherty (1997) sought to develop a less cumbersome and less time-consuming method of determining cue responsiveness (or susceptibility to afferent feedback). He developed the aforementioned Emotional Contagion Scale (ECS), a 15-item measure assessing individual differences in affective susceptibility to mimicry. Whereas a full discussion of the reliability and validity of the ECS is included in Chapter 3, it is relevant to discuss some of the validation of this scale here as well. Doherty (1997) demonstrated that the ECS performed in a manner similar to the method of determining cue responsiveness utilized by Laird et al. (1994). Thus, those who are more likely to be affected by their own emotional expressions (i.e., highly cue responsive) are also more likely to be affected by the emotional expressions of a stimulus person.

Independent validation of Doherty's (1997) ECS is provided by Hietanen, Surakka, and Linnankoski, (1998) who asked participants to complete the ECS, as well as to listen to vocal expressions of affect while their EMG activity was being recorded. Hietanen et al. (1998) demonstrated that individuals' facial expressions tended to be synchronized with the recorded vocal expressions of affect. More specifically, hearing the expression of anger resulted in increased Corrugator muscle activity and a behavioral tendency to withdraw, whereas hearing the expression of contentment activated the Zygomatic region and resulted in a behavioral tendency to approach. The authors

indicated that affect can be transmitted merely by hearing another's vocal expression of affect, and that approach/avoidance action tendencies can, in turn, be communicated via vocal expressions of affect. The relationship between the findings of Hietanen et al. (1998) and Doherty's (1997) ECS is that ECS scores were predictive of the degree to which affect and action tendencies were transmittable via vocal expressions. In other words, Hietanen and colleagues' research provides further evidence that the ECS is a measure distinguishing individuals who tend to be more susceptible to emotional contagion from those who are less so.

In summary, this literature review has thus far described a number of contemporary research studies examining the component processes of emotional contagion (mimicry, feedback, and contagion). Buck's (1980) facial feedback hypothesis was presented, and despite the abundance of supportive research, the difficulty in conclusively determining the validity of this argument was discussed. Additionally, the concept of cue responsivity as an individual difference variable that mediates the occurrence of emotional contagion was discussed.

A number of scientists have examined humans' innate tendency toward autonomic synchrony with other individuals' autonomic nervous systems across a host of interpersonal scenarios. Many of these researchers have posited beliefs regarding how synchrony provides an evolutionary advantage. The following portion of this literature review will summarize the teleological value of emotional contagion. Simply stated, because mimicry, afferent feedback, and synchrony are so pervasive and widespread, many scientists have hypothesized on the survival value of contagion.

Evolutionary Basis of Emotional Contagion

A brief review of the function of emotions may be beneficial to understand the teleological value of emotional contagion. Emotions are thought to serve multiple survival functions. Levenson (1996) stated that "emotions evolved to support both interpersonal and intrapersonal processes, serving the most elementary survival needs of the group" (p. 186). Perhaps the single most important function of emotion is to motivate human behavior (Bradley, 2000). For example, Eisenberg, Fabes, Miller, Fultz, Shell, Mathy, and Reno (1989) presented participants with a tragic story while monitoring their ANS activation levels. Participants who were more likely to offer assistance to the fictional victim tended to have higher levels of ANS activation. This study supports the currently accepted perspective that emotion serves important motivational functions. Thus, emotion often motivates approach/avoidance behaviors.

A second basic survival function of emotions is that they channel cognitive perceptions (Bower, 1981; Forgas, 1995). Bower's (1981) research indicated that emotion influenced cognitive events, such as free association, imagination, fantasies, how one interprets another's behavior, and snap judgments about another's personality. Additionally, Bower's research demonstrated that when the affective tone of a narrative and an individual's mood state were similar, the memorability and salience of the narrative were significantly higher than if these two emotional components were disparate. In conclusion, Bower (1981) clearly demonstrated that affect has a large impact on cognitive processes.

The practical implications of this line of research are important to consider. As cognitive processors, human beings live much of their life in uncertainty, perceiving

events, but not being clear as to their meaning. Throughout the course of life people are faced with a tremendous amount of decision making based on inference and interpretative processes, (e.g., What is the exact meaning of that comment? Am I in danger right now?), rather than on a concrete understanding of an objective reality. Bower's research suggests that people tend to utilize their state affect to aid in the interpretation of these ambiguous social situations. In summary, affect serves at least two important survival functions. First, it motivates approach/avoidance behaviors, and second, it channels cognitive processing.

The question remains; how does emotional contagion increase individuals' likelihood of survival? The teleological value of nonverbal emotional communication has been discussed extensively throughout the emotional contagion literature. Humans developed the physiological structures enabling verbal speech approximately 50,000 years ago. However, because of peoples' reliance on social inter-relatedness for their very existence, it seems unlikely that humans were wholly unable to communicate prior to this. Charles Darwin (1872/1965) argued that facial expression of emotion has an adaptive value because it reveals something about the inner state of the responder that is observable to others. For example, according to Darwinian theory, the ability to alert others to the presence of danger would be extremely valuable to the success of a cooperative species. Of equal evolutionary value is the ability for both males and females to detect "alpha males" (or the dominant member of a social group), thereby increasing the likelihood of passing on their genes. Gordon (1996) wrote, "During his famous voyage on the Beagle, Darwin had the opportunity to observe and interact with various peoples, including those in preliterate cultures. His observations suggested that basic

emotional expressions were universal for humans and that there was no communication barrier at this level. This direct communication process represents what we suggest is a conversation between limbic systems" (p. 23).

Indeed, Ekman and Freisen's (1975) work indicated that there are six universal facial expressions existing in identical forms across all cultures (surprise, disgust, sadness, anger, fear, and happiness). Stated differently, in all cultures, facial expressions communicate similar, if not identical, information about one's affective state. In fact, research suggests that the communicative power of facial expressions is biologically based and innately organized. Nonhuman primates display similar facial expressions to humans, and the meanings of these expressions are similar to those of human facial expressions (Ekman & Freisen, 1975).

Further information regarding the evolutionary value of emotional contagion can be found in newborn infants, who tend to mimic the facial actions of their caregivers (Field et al., 1982). Malatesta and Haviland (1982) examined emotional communication between mothers and newborns, and found that a large vocabulary of emotionally expressive behavior is absent between congenitally blind children and their mothers. The similarity of facial expressions across distinct cultural groups, the fact that humans and primates display similar facial expressions, the fact that newborn children mimic facial expressions at birth, and the lack of facially expressive behavior in congenitally blind children all suggest that facial expressions are a medium of the universal language of emotion.

Given that it is automatic and innate, facial mimicry appears to function as a primitive and pervasive component of nonverbal interpersonal communication. Gordon

(1996) provided a fictitious, modern-day example of how emotional contagion may serve to enhance human communication, thereby increasing one's likelihood of survival. Gordon (1996) described a mother and a preverbal child crossing a street. The mother notices that a car is bearing down upon them, feels trepidation, and thus emits a startled/frightened facial expression. The child mimics this response and comes to feel the same fear and ANS activation his/her mother is experiencing. Perhaps the child then turns his/her gaze toward the source of his/her mother's fear; the oncoming car, and through the processes of classical conditioning, pairs this hypothetical car with the emotional experience known as fear. In this manner, the child has learned, completely through nonverbal channels, that the oncoming car is to be feared.

Gordon's (1996) example illustrates why the communication of emotions via contagion can increase human beings' likelihood of survival. Upon closer examination of this anecdote, it is apparent that emotional contagion may provide a nearly instantaneous method of interpersonal transmission of both the previously discussed survival values of emotions. First, the fearful emotions motivated withdrawal behavior. Second, via classical conditioning, the emotions may have channelized the child's cognitive perceptions of such elements as the street being crossed, oncoming cars, and his/her mother. Whereas this account is suggestive of the type of rapid communication yielded by emotional contagion, it is anecdotal and speculative. Such post hoc accounts of evolutionary psychology are open to critique. Several studies will be reviewed that support the hypothesized evolutionary advantages of emotional contagion.

Levenson (1996) viewed contagion as having important implications for group cohesion (e.g., smiles indicating bonding, approval and acceptance) and group survival

(e.g., alerting others of imminent danger). According to Levenson (1996), research by Orr and Lanzetta (1980) supports the teleological value of contagion. Orr and Lanzetta (1980), demonstrated that facial signals of threat are more difficult to ignore than are facial expressions of contentment. Orr and Lanzetta (1980) also demonstrated that it is more difficult to condition a happy face than a fearful face. This is likely indicative of the relative survival value of missing a danger signal, as opposed to missing a signal of contentment. Orr and Lanzetta summarized these findings by stating, "Signals of danger/threat [as opposed to signals of contentment] can be perceived and processed efficiently, automatically, and seemingly outside of conscious awareness" (p. 240). Orr and Lanzetta's (1980) research supports the concept that emotional contagion provides a significant evolutionary advantage because it enhances transmission of important, survival related emotional messages.

In summary, as previously indicated, emotions serve at least two important survival functions; motivating approach/withdrawal behavior and aiding cognitive perceptions. Emotional contagion appears to be a form of primitive communication dating back to humans' preverbal days, allowing individuals to relay nonverbally important information concerning approach/withdrawal behavior and cognitive perceptions. Clearly many of the hypotheses regarding the teleological value of emotional contagion are merely speculative. However, the automaticity and innate nature of emotional contagion suggest that it is a pervasive communication tool. Research has demonstrated that this form of communication is capable of relaying important information from one individual to another. Thus, facial expressions appear to constitute

both communication input (emotional modulation), as well as communication output (signaling).

Emotional Contagion and Empathy.

What is the relationship between emotional contagion and empathy? Gordon (1996) suggested that emotional contagion is a primitive sympathetic response that is not equivalent to the construct of empathy. One may "catch" an emotion, but he/she does not necessarily know what this emotion is about. For example, Gordon presented a hypothetical situation in which a mother gets promoted at her job. Upon returning to her home later that day, her daughter sees her smiling and smiles herself, thereby "catching" her mother's happiness. The child, however, is unaware that her mother just got hired. Whereas it would appear reasonable to suggest emotional contagion has taken place, true empathy has not. Emotional contagion is defined as the process whereby the emotions experienced by one person are transmitted to another person (Thompson, Nadler, & Kim, 1999). On the other hand, empathy more broadly encompasses emotional contagion, empathic reaction (responding to another person's emotions), and empathic accuracy (cognitively knowing what another person is feeling; Levenson, 1996; p. 187).

Some research has focused on clarifying the relationship between emotional contagion and empathy. Findings suggest that emotional contagion is one of the component processes of empathy. In fact, Lanzetta and Englis (1989), who focused a substantial portion of their research on mimicry and contagion, referred to emotional contagion as the "biological substrate of empathy."

Gladstein (1983) reviewed the counseling, social, and developmental psychology literature to determine commonalties among construals of empathy. Despite the fact that

different measures and definitions of empathy were used within these sub-disciplines, Gladstein (1983) found that the disparate research findings consistently identified two major types of empathy. Specifically, the three fields all discriminated between affective empathy and cognitive empathy. Affective empathy refers to feeling the same way another person feels, whereas cognitive empathy refers to a role-taking form of empathy. Gladstein (1983) reported that across the three various sub-disciplines of psychology, affective components of empathy included identification, resonation, emotional reaction, and emotional contagion, all of which could be summarized in the saying "I feel what you feel." Conversely, cognitive empathy refers to such processes as role-taking, perspective-taking, prediction, and communication, which could be summarized in the saying "I comprehend what you feel." In summary, emotional contagion has been theorized to be one of the affective components of empathy.

Factors that Moderate the Occurrence of Emotional Contagion.

Although a great deal of research has demonstrated that emotional contagion is a common phenomenon, there are many cases in which people do not catch the emotions of those with whom they are interacting. For example, it would not always be in an individual's best interest to mimic anger. Instead, when confronted with an angry individual, many people are likely to respond with a "reactive" emotion, such as fear or indifference. Similarly, perhaps through the processes of mood maintenance, not all jovial people are disheartened through contact with sad individuals. As a result of these critiques, a (if not the) central issue in contemporary contagion research concerns understanding and predicting those situations and personality factors that make contagion

more or less likely. This section of the literature review will address research that has examined the factors that moderate the incidence of emotional contagion.

Hatfield et al. (1994) recounted viewing a tennis match between Ivan Lendl and John McEnroe on television. During those instances when one player smiled (presumably after winning a point or a game), they noticed that the other player tended to grimace or frown. This phenomenon, known as "counter-empathy" or "emotional reactivity," is well documented in the emotional contagion and facial mimicry research literature (e.g., Lanzetta & Englis, 1989; Levenson, 1996; McHugo, Lanzetta, Sullivan, Masters, & Englis, 1985; and Vaughan, & Lanzetta, 1981). Counter-empathic facial expressions appear to carry dual meanings. First, they accurately signify what the other is feeling and what the outcomes are for that person. Second, the personal implications for the receiver are reversed (Levenson, 1996). The McEnroe-Lendl anecdote is emblematic of literature indicating that emotional contagion is moderated by one's context and cognitive processes.

Lanzetta and colleagues hypothesized that facial expressions are a largely automatic or innate level of social communication. They also recognized the "need for this channel to be responsive to the complex cognitive and social environment in which it operates" (Levenson, 1996; p. 245). Lanzetta and colleagues conducted a series of studies to examine those factors that moderated facial mimicry. Results suggest a complex relationship in which facial mimicry appears automatic in many respects, yet is still sensitive to, and modified by, the situational contexts in which stimuli are observed. Said differently, facial mimicry has an automatic component, but, as the anecdote concerning

McEnroe and Lendl suggests, it can be modified as a function of context (Levenson, 1996).

Utilizing EMG recordings, Vaughan and Lanzetta (1981) demonstrated that in competitive situations, individuals tended to adopt counter-empathetic facial responses to their opponents' facial expressions. However, when people shared the same fate, such as when their outcomes were jointly shared, they expressed empathic facial responses. These results were demonstrated despite the fact that the cooperative/competitive outcomes were randomly assigned. In other words, participants were randomly assigned cognitive expectations of the degree to which their counterparts would cooperate or compete with them, and these randomly-assigned expectations dictated whether an individual was emotionally congruent or reactive. Thus, cognitive processes appear to play an important role in determining when emotional contagion will be evidenced.

Lanzetta and Englis (1989) conducted another study examining cognitive mediators on mimicry, in which participants viewed videotapes of someone either being shocked or rewarded. Individuals who were shocked tended to display a grimace, whereas those who were rewarded displayed smiles. Furthermore, participants were also told that they would either be competing or cooperating with these videotaped individuals in the future. In the "cooperation" condition, emotional contagion occurred, whereas in the "competition" condition, emotional reactivity was demonstrated. "Clearly what appeared at first to be an automatic and homologous process [i.e., emotional contagion] was much more complex; emotions expressed by one individual could beget quite different emotions in the observer" (Lanzetta & Englis, 1989; p. 188).

Relative level of personal power is another contextual variable that has been hypothesized to moderate the flow of contagion. Hsee, Hatfield, Carlson, and Chemtob (1990) hypothesized that relatively powerless people should be influenced to a greater extent by the emotions of more powerful individuals than vice versa. More specifically, the authors indicated that "subordinate" individuals would likely tend to be more attentive to their "superiors'" emotions, and as a result, would be more likely to "catch" these emotions. In essence, Hsee et al. (1990) hypothesized that relative level of power is a situational factor affecting an individual's level of emotional receptivity. Emotional contagion was evidenced via both judges' ratings of participants' videotaped facial expressions, and participants' self-reports of state affect. Surprisingly, data analyses indicated that the emotions tended to "flow" from subordinates to superiors. In other words, individuals with greater relative power were actually much more likely to catch the emotions of those with less power. Hsee et al. (1990) believed that the most likely explanation for these findings is that the superiors were given too much power (the "superiors" believed that they were responsible for shocking the subordinates). Thus, Hsee et al. (1990) believed that the study was confounded because the superiors likely felt guilty and responsible for the emotions of the subordinates. Unfortunately, no follow-up studies were located that examined the effect of power on emotional contagion using a less confounded operationalization of power.

McHugo et al. (1985) conducted a study remarkable in both methodology and findings. Participants' EMG levels, ANS activation levels, and self-reports of state affect were recorded while individuals viewed videotapes of then-President Reagan. Participants were also asked to rate their personal attitudes towards the ex-President. The

benefit of this methodology was that the cooperative/competitive attitudes that were elicited (i.e., attitudes toward President Reagan) were both naturally occurring and easily measurable. Interestingly, regardless of participants' pre-recorded opinions of Reagan, both facial expressions (as monitored by EMG recordings) and ANS activation levels were congruent with the valence of President Reagan's emotional expression. Thus, participants did engage in mimicry (as opposed to reactivity). However, self-reports of state affect were strongly influenced by the participants' attitudes regarding President Reagan. Those who liked him "caught" his emotions, whereas those who disliked him reported experiencing counter-empathy. This study highlights a potentially important discrepancy between self-reports of emotion and actual physiological recordings of emotion, and raises the question "which aspect of emotion is more important, and in what situations?" Clearly, in the McHugo et al. (1985) study, valence of prior attitudes overrode emotional contagion. For this reason, studies that employ physiological data, as well as self-reports of state affect, may provide the optimal approach to studying emotional contagion. In summary, whether individuals experience empathy or counter-empathy depends on factors such as context (i.e., cooperation or competition), prior experience with the stimuli (i.e., favorable or unfavorable), and the component process of emotional experience being utilized as a dependent variable.

Applied Studies Examining the Effects of Emotional Contagion

Hatfield et al. (1994) described the effects of emotional contagion as being both subtle and profound.

> Subtle due to their automaticity, profound in the level of their effect on a person's moment to moment feelings. So although they might

> not be the salient features of an individual's episodic memory, they represent the ground against which the images and events of social interaction are perceived and remembered (p. 62).

Thus, emotional contagion has implications in applied social settings. The remainder of this literature review will be devoted to examining studies that investigated emotional contagion in both the health care industry and business settings.

Research examining the implications of emotional contagion in business settings. Verbeke (1997) examined the relationship between individual differences in emotional receptivity, emotional transmission, sales performance and salesperson "burnout." The construct of emotional receptivity was assessed by Doherty's (1997) ECS, whereas the construct of emotional transmission was measured with Klein and Cacioppo's (1993) FES. Like Hatfield et al. (1994), Verbeke (1997) conceptualized individual differences in tendency to transmit and receive emotion as distinct dimensions. This conceptualization resulted in the fourfold typology demonstrated in Table 3. Verbeke termed those individuals who were high in both their tendency to infect others with (or transmit) their emotions, and in their tendency to catch (or receive) emotion "charismatics." He referred to those individuals who were low transmitters and high receivers as "empathetics." Those high in emotional transmission and low in receiving were referred to as "expansives." Finally those individuals who were low in ability to both transmit and receive emotion were termed "blands."

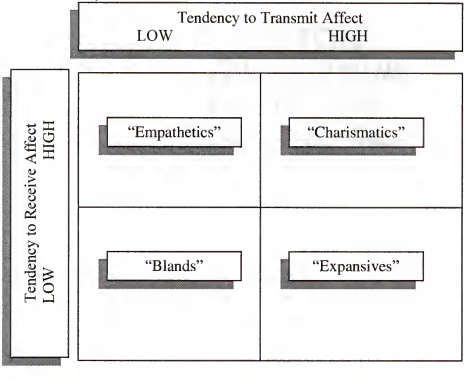
Verbeke (1997) utilized this fourfold typology to examine sales performance and burnout among salespersons. Sales volume was not statistically different for "charismatics" and "empathetics." However, it was significantly greater for these two groups than for those labeled as "expansives" and "blands." Salesperson burnout was also significantly higher in those individuals who tended to be infected by others' emotions

(e.g., charismatics and expansives). Thus, salespersons' levels of emotional receptivity have been demonstrated to be associated with both greater sales volume, and higher rates of employee burnout. Verbeke's results support the conclusion that the processes of emotional contagion naturally occur in professional interactions, and individual differences in these processes are associated with important and predictable differential behavioral outcomes.

Totterdell et al. (1998) conducted two studies examining the linkage between individual employee's affect and the affect of their workmates over time. The authors collected data from two distinct professional populations; nurses and accountants. Study 1 examined whether the collective mood of a nursing team was predictive of individual nurses' moods. A pooled time series analysis demonstrated a significant association between individual nurses' moods and the collective moods of their workmates. It is important to note that the association between nurses' moods was not demonstrated to be dependent on shared hassles, such as day of the week or how busy the nurses were. Furthermore, the association was greater for nurses who were older, were more committed to the team, perceived a better team climate, or experienced fewer hassles with their teammates. It is likely that these moderating factors are related to situations that would reduce the aforementioned construct of counter-empathy. Study 2 looked at mood linkage within a sample of accountants who worked together. This study also demonstrated mood linkage, in that accountants' moods were also significantly associated with the moods of their workmates. Totterdell et al. (1998) indicated that emotional contagion provides a parsimonious explanation for these findings. However, it is important to note that in Study 2, accountants were able to consciously and accurately

Table 3.

Fourfold typology representing Verbeke's conceptualization of tendency to transmit affect and tendency to receive affect as distinct dimensions



assess the mood of the team, which provides a potential non-contagion related explanation for the findings (i.e., social comparison).

Thompson et al. (1999) authored a theoretical paper that discussed the role of affect in business negotiations. Thompson et al. (1999) viewed affect in negotiations, not as a liability, but rather as something to be aware of and to utilize to one's advantage. The authors suggested that cognition has been the dominant paradigm with which to understand business negotiations, but previous discussions of the role of affect in

negotiation have been simplistic (i.e., heuristical processing). The authors suggested that affect in negotiations typically has been viewed as noise or a nuisance, and argued that the strictly cognitive negotiator would not be as effective as one who understands and effectively utilizes emotional tactics.

Thompson et al. (1999) provided several suggestions to effectively utilize emotional contagion in business negotiations. More specifically, Thompson et al. (1999) indicated that individuals in competitive situations tend to adopt counter-empathic facial responses to their opponents' facial expressions. However, when people share the same fate, such as when their outcomes are jointly shared, they show empathic facial responses (and in turn emotional contagion). Thus, the adoption of win-win negotiation strategies would increase the likelihood of emotional contagion, which may be beneficial for fiscal outcomes. Thompson et al. (1999) indicated that negotiators who mimic emotions and experience emotional contagion are likely to be more accurate in judging others' emotions (p. 147). They also indicated that negotiators who do not engage in mimicry of emotional expressions are likely to be less effective negotiators than those who are facially responsive. Furthermore, the authors indicated that because happy negotiators are better at expanding the resources available to both parties, negotiators may benefit from inducing positive affect in their opponents as well as in themselves. Thompson et al. (1999) did not provide empirical support for these suggestions, so they must be viewed as hypotheses worthy of investigation. However, Verbeke's (1997) research suggested that emotional receptivity is significantly correlated with increased sales performance.

Research examining the implications of emotional contagion in health care settings. Several studies examined the implications of emotional contagion within health care settings.

Tickle-Degnen and Puccinelli (1999) conducted two studies that examined the association between the degree of expressiveness of occupational therapy students, their affective valence, and both interpersonal and evaluative outcomes. Tickle-Degnen and Puccinelli (1999) asked occupational therapy students to interact in dyads. When the student with the higher degree of negativity was the more expressive one, both students responded with less positive feelings and nonverbal behavior than when the more positive person was more expressive.

In a follow up study, Tickle-Degnen and Puccinelli (1999) examined the relationship between degree of expressivity, affective valence, and evaluative reports by the students' clinical supervisors. Results demonstrated that emotionally negative individuals, who were also expressive, were evaluated by their clinical supervisors as being less clinically skilled than their equally expressive yet more positively valenced counterparts. The authors suggested that these findings indicated that, "the control of the expression of negative emotions and the open expression of non-negative ones may be conducive to developing an interpersonal climate of rapport" (p. 35). The authors suggested that emotional contagion may have mediated the associations that were found. This assumption must be regarded with some degree of caution, as the authors did not demonstrate that emotional contagion was the variable that best explained these findings.

Donner and Schonfeld (1975) examined the impact of clients' affect on beginning psychotherapists. The authors suggested that personal characteristics predict the degree to which contagion will impact therapists. More specifically, they took a Rogerian view, and stated that the greater the difference between one's real and ideal self, the greater the likelihood of mood contagion. Thirty-four therapists-in-training were divided into two groups on the basis of whether their actual and ideal self-concepts were more or less

congruent. Revised versions of Lorr and McNair's Interpersonal Behavior Inventory and the Psychiatric Outpatient Mood Scale were used to assess therapists' and clients' feelings of anxiety, depression, and anger before and after their first and last therapy sessions. The neophyte therapists' moods were demonstrated to be significantly related to their clients' moods. This effect was moderated by the degree of congruency between their real and ideal self-concepts. Thus, according to Donner and Schonfeld (1975), the greater the discrepancy between a beginning therapist's real and ideal self-concept, the more likely the therapist was to "catch" their clients' moods.

Rosen, Walsh, and Lucas (1988) examined the outcomes associated with adding a group of seriously emotionally unstable individuals to a pre-existing treatment unit. The authors hypothesized that longer-term patients would "catch" the moods of the new admitees. However, neither the behavioral nor emotional disruptions displayed by the newly admitted patients were imitated by the longer-term patients. The authors hypothesized that the structured form of treatment was likely the factor responsible for the established group members "catching" the new admitees' affect.

Miller, Stiff, and Ellis (1988) examined personal traits that led to burnout among healthcare providers. More specifically, Miller et al. (1988) recorded levels of communicative responsiveness, empathic concern, emotional contagion, and occupational burnout for 285 primary caregivers' (i.e., nurses, physicians, psychologists, therapists, and social workers) and 132 support staff (accountants, housekeepers, record keepers, and food service workers). The presence of emotional contagion was assessed by examining the similarity between seven self-reported factors of employee and client state affect. Support staff displayed higher levels of emotional contagion ($\underline{M}$ = 15.66) than did

primary caregivers (M = 14.53). "Though this effect is not particularly strong (r = .16), it can be interpreted as evidence that primary caregivers have developed a sense of detached concern" (p. 262). Additionally, a link was established between emotional contagion and communicative responsiveness (r = -.33). Communicative responsiveness was described by Miller et al. (1988) as a "reflexive stance in which the caregiver allows the [client] to set the conversational agenda [to which the caregiver] adapts accordingly" (p. 253). This link between emotional contagion and communicative responsiveness suggests that sharing another's emotions would likely hamper one's ability to be communicatively responsive (p. 262).

In summary, a number of studies have examined the implications of emotional contagion within two applied settings; the health care industry and business settings. This research has consistently demonstrated that individuals tend to "catch" each others' moods (i.e. Totterdell et al. 1998; and Donner & Schonfeld, 1975). Furthermore, there are predictable outcomes associated with both emotional contagion and with the component processes of emotional contagion (e.g., emotional transmission, emotional receptivity and valence of state affect). For example, Verbeke (1997) demonstrated that tendency to receive others' affect (as measured by ECS scores) was positively correlated with both sales performance and salesperson burnout. Additionally, Tickle-Degnen and Puccinelli (1999) demonstrated that relative level of expressiveness was predictive of the transmission of affect, with affect more likely to be transmitted from more expressive to less expressive individuals. Tickle-Degnen and Puccinelli (1999) also demonstrated that the combination of relative level of expressiveness, as well as the valence of expressed affect was predictive of professors' evaluations of occupational therapists-in-training.

Applied research on emotional contagion is becoming more common as this process is associated with important financial and emotional outcomes. However, the validity of many of these applied studies appears to be questionable because they include no assessment of the degree to which contagion caused emotional congruence.

Critique of the Emotional Contagion Research

Research on emotional contagion has demonstrated an eclectic set of findings. For example, it appears as though individuals instinctively tend to mimic facial expressions (e.g., Dimberg, 1990). Additionally, some research suggests that facial expressions, in and of themselves, have the capacity to modulate state affect (Strack et al., 1988). However, important gaps still exist in this relatively new empirical literature. One of the most basic gaps in this literature concerns the fact that no research has conclusively demonstrated that afferent feedback is the mechanism linking facial mimicry to fleeting changes in state affect. As Levenson (1996) indicated, a methodology that could conclusively validate the role of afferent feedback in emotional contagion has not yet been developed. The inability to demonstrate the importance of one of the three component processes of contagion is not the only problem of note in the contagion literature.

A good deal of emotional contagion research has examined factors that mediate the incidence of emotional contagion. As previously reported, cognitive factors, individual difference variables, and contextual factors all appear to play a role in determining the likelihood of emotional contagion. As of yet, no study or series of studies has comprehensively addressed this topic in a definitive manner. It is likely that continued empirical interest in contagion will further illuminate the topic, such that those

factors predicting the likelihood of contagion will be understood more comprehensively. However, as of now, the study of emotional contagion lacks this degree of understanding regarding when contagion is to be expected.

Many of the aforementioned applied studies (e.g., Donner & Schonfeld, 1975; Miller et al., 1988; Rosen et al., and 1988 Totterdell et al., 1998) appear to have made the debatable assumption that mood congruence equates to emotional contagion. As previously reported, emotional contagion consists of a three-step process whereby an individual mimics the facial expressions of another, then afferent feedback is relayed to cortical processing centers, and the individual comes to feel the same emotion as that of the mimicked individual. On the other hand, mood congruence merely indicates that an individual feels the same emotion as another. There are other processes whereby an individual could experience the same emotion as another that do not require contagion (e.g., the situation elicits the same affective response in both people). Plausible alternative explanations for why two individuals may experience identical moods challenge the notion that emotional contagion is unequivocally the cause of mood congruence. One way to address this gap in the literature is to incorporate a greater degree of physiological recordings into applied research on emotional contagion. However, incorporating these physiological recordings into applied emotional contagion research likely would threaten external validity, the prime reason to conduct applied research. At the very least, it appears that applied research should incorporate validity checks into their methodology in order to conclude that contagion is causing the demonstrated mood convergence.

The final critique of the emotional contagion literature that will be presented in this review is perhaps the most troublesome. A study by McHugo et al. (1985) previously discussed in this review, involved assessment of contagion while individuals watched videotapes of President Reagan. McHugo et al. (1985) demonstrated that all individuals, regardless of prior attitudes toward Reagan, mimicked the President's facial expressions. However, only those individuals who had pro-Reagan attitudes reported "catching" his emotions. This study may suggest that self-reports of state affect actually may be assessing affect previously infused into cognitions and attitudes, rather than what has been traditionally believed to be self-reports of state affect. Forgas (1995) indicated that affect is only infused into attitudes in certain critical conditions (see Forgas, 1995 for a review of the affect infusion literature). Once affect is infused into attitudes, assessments of state affect may actually represent the valence of affect previously infused into attitudes, rather than the valence of current affective experience. Stated more simply, one potential crisis for applied contagion research is that self-reports of state affect might actually be inaccurate, and therefore the conclusions drawn from them would be misleading. At the very least, the relationship between contagion and cognition is more intricate than is currently reflected by the contagion literature. McHugo et al's (1985) findings suggest that utilizing only self-reports of state affect or only physiological recordings of affect as the sole predictor of contagion provide an incomplete and questionable outcome measure.

In summary, emotional contagion research, which is still in its infancy, has several significant theoretical and empirical gaps. First, the field is hampered by simplistic methodologies that are unable to distinguish between contagion and

congruence. More rigorous and extensive laboratory studies are needed to understand cognitive and contextual restraints on contagion more clearly. Additionally, experimental studies, or, at the very least validity checks, are needed to assume contagion causes similarities in affect. Advances in physiological research are needed to demonstrate that afferent feedback mediates the relationship between facial mimicry and state affect. Finally, a more accurate understanding of what self-reports of affect actually assess are needed to further emotional contagion research. Although groundbreaking research has been conducted in the study of emotional contagion, many important questions remain to be answered.

Overall Summary of Emotional Contagion Research

This chapter represents a comprehensive review of empirical research on emotional contagion, as identified in the PsycInfo database as of July, 2000. First, empirical research concerning the three component processes of contagion (mimicry, afferent feedback, and contagion) was reviewed. Numerous studies have supported the hypothesis that humans instinctively tend to mimic each other's facial expressions (see Dimberg, 1990 for a review of this literature). In fact, research has suggested that humans tend to be in synchrony across a variety of affective domains, including facial expressions, ANS activation, and subjective reports of emotional states (e.g., Levenson & Reuf, 1997). Mimicry was also demonstrated to be automatic, nearly instantaneous, and pervasive (Dimberg, 1990). Afferent feedback, the second component process of emotional contagion, has been the most contested of the three processes of contagion. Some researchers question the role that facial expressions play in the formation of emotion. Whereas numerous studies have demonstrated that facial expressions play a role

in the formation and modulation of emotion (e.g., Strack, et al, 1988), no method currently exists to demonstrate conclusively that feedback is the mediating process whereby facial expressions influence mood state. Additionally, research by Doherty (1997) and Laird et al. (1994) suggests that the degree to which facial expressions influence subjective mood states varies across individuals. This individual difference variable has been referred to in the empirical literature both as cue-responsivity and as emotional receptivity.

Many scientists have indicated that emotional contagion exists as a primitive form of communication and serves an important survival function, a nearly instantaneous method of transmitting emotion that is universally understood. The similarity of facial expressions across different cultures, the fact that newborn children mimic facial expressions at birth, and the fact that humans and primates display similar facial expressions all seem to support the conclusion that facial expressions constitute a universal medium for the interpersonal expression of emotion. However, it was also suggested that post hoc analyses invoking concepts of evolutionary psychology are speculative and open to critique. Thus, speculations regarding the survival value of emotional contagion are intriguing, but they are difficult to prove conclusively.

Research examining the relationship between contagion and empathy was also reviewed. Gladstein (1983) demonstrated that what is commonly referred to as empathy appears to consist of at least two major components; an affective component and a cognitive component. The affective component of empathy can be summarized in the saying "I feel what you feel," whereas the cognitive component can be summed up in the saying "I understand what you feel." Gladstein (1983) suggested that both the affective

and cognitive components of empathy consist of several sub-processes. Emotional contagion was suggested to be a central sub-process of affective empathy.

An important issue in emotional contagion research concerns the relationship between contagion and counter-empathy. Whereas contagion is a common process that most, if not all, people engage in, it must be distinguished from the related process of counter-empathy. As previously discussed, counter-empathic responses carry dual messages (Levenson, 1996). First, they indicate that the individual is aware of what the other person is feeling. However, counter-empathic responses also suggest that, because the personal implications of the situations are reversed, the "emotional receiver" actually experiences a reactive emotion. As instantiated by the aforementioned MacEnroe/Lendl anecdote, emotional reactivity refers to a process whereby an individual emotionally reacts to the affect transmitted by another individual with a response other than mimicry. Reactivity appears to be indicative of a more cognitive response than does emotional contagion, which appears to be more primitive.

Research has also demonstrated that various contextual and cognitive processes influence the likelihood of contagion. For example, Vaughan and Lanzetta (1981) and Lanzetta and Englis (1989) demonstrated that individuals' cognitive perceptions of cooperation versus competitiveness strongly predicted whether they would respond with contagion or with counter-empathy. McHugo et al. (1985) conducted an important study in which it was demonstrated that whereas people of all political hues mimicked ex-President Reagan's facial expressions, only those with pro-Reagan attitudes reported feeling the same emotions as Reagan. Thus, situational and cognitive factors appear to influence the likelihood of contagion.

Finally, applied studies examining the presence and impact of emotional contagion in business and health care studies were reviewed. Contagion was evidenced in several applied studies that examined contagion in both health care settings (e.g., Tickle-Degnen & Puccinelli, 1999), and various business settings (e.g., Totterdell, et al, 1998). Furthermore, studies were reviewed that suggested that both contagion and contagion-related individual difference variables (e.g., emotional transmission, emotional receptivity, and valence of state affect) have predictable outcomes within business (e.g., Verbeke, 1997) and health care settings (e.g., Miller et al., 1988).

CHAPTER 3
METHOD

Participants

Servers were recruited from several local restaurants. Larger restaurants were selected in order to minimize the number of sites the research team had to monitor in order to attain a sufficient number of participants. In order to reach comparable effect sizes to those found in 3 other (e.g., Rind,1996; Crusco & Wetzel, 1984; Lynn & Mynier, 1993) conceptually related, statistically significant studies on tipping (i.e., $f^2 = .12$ at a power level of .95 and an alpha of .05), at least 222 dining parties were needed for this study. The selected restaurants were moderately priced dining establishments that served both lunch and dinner.

Restaurant managers were contacted and the general intent of the study was explained to them. Additionally, they were presented with the potential benefits and costs of participating in the study. Benefits to restaurants participating in this study included a seminar that will be held for servers at the conclusion of the study. This seminar will incorporate the findings of the current study, as well as the findings of a number of prior studies on correlates of restaurant tips. The researcher also offered to conduct and interpret a customer evaluation survey, conducted as part of the overall investigation.

Measures

Performance/Outcome variables. The outcome measures for the wait-staff were twofold. First, servers recorded tip percentages for each table that they waited on in a

given shift. In order to achieve stable mean values, servers were requested to record a minimum of 10 check/tip combinations. Second, restaurant customers were provided with an opportunity to complete a brief satisfaction survey. This survey provided indices of customer satisfaction with food and service, as well as customers' state affect (see Appendix A).

The customer satisfaction survey is a replication of the exit questionnaire developed by Lynn and Grassman (1990) with the addition of a brief measure of state affect (SAM). Lynn and Grassman's survey consists of six questions, each to be answered on a five-point scale. The first three questions, (Given a five point scale, with A = excellent, B = good, C =average, D = below average, and F = poor, how would you rate your food on appearance, taste and value?) provide an index of food satisfaction. The next three items (Given a five point scale, with with A = excellent, B = good, C =average, D = below average, and F = poor, how would you rate the service you received on promptness, friendliness, and attentiveness?) provide an index of service quality.

Demographics. Wait staff were asked to indicate their race, gender, total months of serving experience, and total number of months working at their current site of employment (see Appendix B).

State affect. The Self-Assessment Manikin (SAM; Lang, 1980) is a state affect self-report measure born from research on biphasic theories of emotion (see Appendix C). The SAM is a three-item picture-oriented measure providing nonverbal self-report data on valence, intensity, and dominance of state affect. Because the dominance measure has previously displayed relatively low reliability ratings (Lang, 1980) and because this study offers no predictions regarding the impact of dominance scores on evaluative

outcomes, only the valence and intensity dimensions of the SAM were employed in the current study. To assess the valence dimension of emotion, the SAM provides five cartoon figures varying from a smiling figure to a frowning figure. Individuals are instructed to select the figure that most accurately reflects the valence of their current affective state. To assess the arousal dimension of affect, the SAM varies from an excited, wide-eyed figure, to a relaxed, sleepy figure. Again, individuals are instructed to select the figure most accurately reflecting the intensity of their current affective state.

In previous research (Bradley & Lang, 1994, Lang 1980) the SAM has been reported to be a reliable and valid measure. The benefit of utilizing the SAM is that it provides a quick, nonverbal method of assessing state affect. Reliability and validity studies have demonstrated that the valence dimension of the SAM correlated highly (.97) with the valence dimension in Mehrabian and Russel's (1974) verbal and lengthier Semantic Differential Scale (Bradley & Lang 1994). The arousal dimension of the SAM also correlated highly (.94) with Mehrabian and Russel's (1974) arousal dimension of affect. In summary, the SAM appears to be a valid and efficient method of assessing two primary dimensions of affect; valence and arousal.

Emotional receptivity. Emotional receptivity refers to the degree to which one's moment-to-moment affective state is influenced by the process of emotional contagion. This trait can be conceptualized as one's innate susceptibility to be affectively influenced by the moods of others. The Emotional Contagion Scale (ECS; Doherty, 1997) is a 15-item self report inventory (see Appendix D) that provides an efficient method of assessing individuals' susceptibility to contagion via afferent feedback resulting from mimicry of another's emotional expressions. Individuals are instructed to respond on a

five-point scale ranging from always to never. Normative data were collected on a large (n=885) diverse sample consisting of students, U.S. Marines, and physicians. The measure's possible range varies from 15 to 75, and the ECS demonstrated a mean of 54.3. Sample items include "I find myself nodding off when I talk with someone who's depressed" and "When someone laughs hard, I laugh too." Doherty (1997) indicated that susceptibility to emotional contagion may be operationally defined as "the frequency with which emotional stimuli elicit an emotional expression characteristic of the eliciting emotion" (p. 134). As such, the ECS assesses not only facial mimicry, but the whole spectrum of mimicry (e.g., postural and echoic mimicry).

The ECS demonstrated high internal consistency reliability (Cronbach's $\alpha = .90$). Furthermore, the measure demonstrated high convergent validity in that it correlated positively with conceptually related measures of reactivity, emotionality, and sensitivity, and was inversely correlated with measures that it theoretically should be inversely associated with, namely social isolation and alienation. As predicted, the scale was unrelated to approval motivation and masculinity, providing further support for the measure's discriminant validity. Doherty also demonstrated that the ECS performed in a manner similar to Laird et al's (1994) previously discussed measure of cue responsivity. In summary, research suggests that Doherty's ECS has performed reliably and validly, and is able to discriminate those with higher levels of emotional contagion from those with lower levels. In addition, the ECS is the only measure to date that has been demonstrated to reliably and validly assess susceptibility to emotional contagion.

Emotional transmission. People differ in the degree to which they emit mimickable emotions and thus their level of emotional influence. Emotional transmission

was assessed via two measures, Klein and Cacioppo's Facial Expressiveness Scale (FES; 1993) and Friedman, Prince, Riggio, and DiMatteo's (1980) Affective Communication Test (ACT; 1980).

The FES (Klein & Cacioppo, 1993; see Appendix E) measures an individual's tendency to display mimickable emotion or "the degree to which individuals tend to wear their emotions on their sleeve" (Hatfield et al., 1994, p. 149). The FES consists of 10 items (e.g., People have told me that I am an expressive person). Responses vary from 0 (Not at all descriptive of me) to 5 (Very descriptive of me). Scores, which may range from 0 to 50, are determined by summing individuals' responses. The mean FES score was 6.72 (SD = .1.22). Women scored significantly higher on the FES (mean male score = 6.35, SD=1.28; mean female score = 7.21, SD=1.03; Klein, 1994).

The FES has been demonstrated to be a valid and reliable measure of expressiveness (Klein, 1994). In support of the measure's reliability, the FES demonstrated sufficient internal consistency (Cronbach's alpha = .84). Furthermore, the measure also displayed a test-retest reliability over a 3 week period of r = .79, p =.01).

Prior research has demonstrated the FES's convergent, discriminant, and predictive validities (Klein, 1994). First, the measure was constructed by instructing individuals to complete 108 items from several commonly used measures of expressiveness, emotional reactivity, and other personality variables. A factor analysis was conducted on the 108 individual items, and ten items were identified as optimal indicators of an emotional expressiveness factor. These items were subsequently aggregated to form the FES. The FES' convergent and discriminant validities were assessed using multitrait-multimethod procedures on the correlation matrices derived

from the administered items. Emotional expressiveness mono-trait correlations were generally greater than the hetero-trait correlations. Specifically, emotional expressiveness mono-trait correlations were greater than corresponding hetero-trait correlations in 207 of the 210 instances. Thus, the FES was highly correlated with other measures of expressivity and less correlated with measures assessing other constructs, such as emotional reactivity, neuroticism, and social anxiety. This pattern of findings is inconsistent with the hypothesis that measures of autonomic reactivity and emotional expressiveness assess the same underlying construct.

Finally, Klein (1994) demonstrated the measure's predictive validity. Participants were instructed to complete several measures of emotional expressiveness. Additionally, a wide range of psychophysiological data (EEG, GSR, heart rate, blood pressure, and several judges' ratings of discrete changes in the participants' facial expressions) were collected while the participants watched affect-inducing video clips. The FES was found to be the most predictive measure of actual facial expressiveness. Furthermore, all expressiveness scales were found to be unrelated to measures of electrodermal and cardiovascular reactivity (i.e., GSR, heart rate, and blood pressure).

The FES was selected as this study's primary measure of emotional expressivity for several reasons. First, it is a short and reliable measure consisting of only 10 items. Second, the correlational and behavioral validation of the measure is more extensive and promising than that of other measures of emotional expressiveness. Finally, the fact that the FES is the most predictive measure of actual facial expressivity is reason enough to employ the FES in this study.

As previously discussed in the explication of Research Question 1, this study employed the ACT (see Appendix F) in an effort to assess the construct validity of the FES and the SAM. The ACT is a 13-item self-report measure that, in past research, has been demonstrated to be a reliable and valid measure of the combination of positive affect and expressiveness, or what is sometimes referred to as "charisma." Original ACT instructions direct participants to indicate on a 9-point scale (from –4 to +4) the extent to which each item is reflective of their behavior. However, in order to have equivalent instructions with several other measures being utilized in this study, participants were instructed to respond on a 6-point scale ranging from 0 (Not at all descriptive of me) to 5 (Very descriptive of me). 6 of the 13 questions are reverse scored. The ACT was normed on two large samples (289 and 311, respectively) of college students and displayed a mean of 71.3 in both samples (SD = 16.4 and 15.2 respectively). Sample items include "My laugh is soft and subdued" and "At small parties I am the center of attention."

The ACT measures one's degree of expressiveness, which refers to an individual's degree of dramatic flair, and is related to the need and successful ability to make an impression. Friedman et al. (1980) referred to the concept as "more closely related to exciting others than manipulating others. Although it does involve a transmission of emotions, there is also a strong element of interpersonal success involved" (p. 348). Thus, according to the hypotheses of the current study, higher scores on the ACT should correspond to higher scores in tendency to transmit positive affect. Because the ACT confounds emotional expressivity with positive affect, it is not a pure measure of emotional expressivity. More specifically, Klein (1994) demonstrated that the ACT displays a strong negative correlation (-.62) with a measure of social anxiety. The

percentage of tips received by servers scoring highly on the ACT was expected to mimic the percentage of tips received by servers with high degrees of emotional expressivity (FES) and positive state affect (SAM).

The ACT demonstrated a coefficient alpha equal to .77. Test-retest reliability was .90 after two months. Thus, ACT is a sufficiently reliable instrument. A variety of methods were used to validate the ACT. The primary validation of the measure was conducted via the comparison of individuals' scores on the ACT with their friends' confidential ratings of how expressive the individuals were in their face, voice, and body, as well as if they thought their friend would make a good actor/actress. These four items were positively inter-correlated, and were thus summed to provide an index of friends' judgments of an individual's nonverbal expressiveness. This index was significantly correlated with ACT scores (r =.39, p =.01). Additional validation was conducted which further supported the ACT as a valid measure of nonverbal expressiveness.

Some question exists as to the degree to which emotional transmission and emotional receptivity exist as distinct constructs. Both emotional transmission and emotional receptivity have been demonstrated to be assessable via relatively short paper-and-pencil measures. The Facial Expressiveness Scale (FES; Klein and Cacioppo, 1993) and the Affective Communication Test (ACT; Friedman et al. 1980) both assess the emotional transmission construct. As previously mentioned, Doherty's (1997) Emotional Contagion Scale (ECS; 1997) is a reliable and valid measure of the emotional receptivity construct. A correlational study was conducted examining the relationship between the constructs measured by the ECS, the FES, and the ACT (Klein & Cacioppo, 1993). Results indicated that, as expected, the ACT and FES were moderately correlated (r =

.32, n = 62 in Study 1; r = .49, n = 33 in Study 2), suggesting that the measures assess related but not identical individual difference variables. Furthermore, the ACT was significantly more predictive of an individual's number of social contacts than was the FES. This finding supports the notion that the ACT is a measure of interpersonal success or charisma, whereas the FES is primarily a measure of tendency to facially express emotions (Klein & Cacioppo, 1993). ECS scores were also significantly correlated with FES scores (r = .46 in study 1, r = .51 in Study 2), suggesting that those individuals who tend to be more facially expressive also tend to be more influenced by afferent feedback via facial expressions. It appears as though the ECS and FES represent related but distinct constructs. Thus, individuals can be thought of as falling into one of four quadrants; high in both constructs (charismatics), low in both constructs (blands), or high in one construct but not the other (empathetics and expansives) (see Table 1).

Procedure

The first step of the procedure involved recruiting servers to participate in the study. As previously mentioned, general managers at several local area restaurants were contacted to determine if they were interested in having their wait staff participate in the study. During this meeting the primary investigator emphasized that individual server's scores and results will not be available to the management teams.

Upon agreement of participation, managers were provided with standardized introductions to the study. The following instructions were read verbatim to the servers by their managers.

"You have been invited to participate in a research study assessing whether several interpersonal cues are predictive of customer satisfaction. Participation in the

study will entail completing several short personality questionnaires that are expected to take less than 10 minutes to complete. During your first work shift after completing the questionnaires, you will be asked to monitor your check totals, corresponding tip totals, and your mood immediately prior to your initial interaction with each of your tables. Finally, you will be asked to leave a customer satisfaction survey with your customers when you present them with their bill. Individuals who participate in the study will be invited to attend a seminar presenting scientific research on simple, nonverbal methods of increasing your tip percentages. The seminar will also present the findings of the current study. Finally, all information collected in this study is anonymous. Neither the research team nor the restaurant management team will be able to identify individual server's responses. If you are interested in participating in the study, please pick up a packet containing further instructions for the study as well as an informed consent form. Once you have signed the informed consent form you will be provided with a packet of questionnaires to be completed at your earliest convenience."

In addition to the managers' verbal presentations of the study, research assistants were available to answer servers' pertinent questions. Furthermore, restaurant managers were provided with posters that were hung up in an area of the restaurant where servers convened. These posters clearly delineated what participation in the study entailed, as well as the benefits of participating in the study. In order to ensure that customers respond naturally, it was important that servers did not discuss the fact that a study on tipping was being conducted. Furthermore, in order to protect the validity of the study, servers were not informed of the exact nature of the study hypotheses. Instead, servers were informed that the current study would assess whether a set of interpersonal cues

were predictive of measures of customer satisfaction. Additionally, servers were informed that whereas the results of individual servers participating in the study would remain confidential, the general findings and implications of the study would be shared with both management and wait staff in an effort to improve the performance of both groups.

Servers who were interested in participating in the study were informed that they must read and sign an informed consent form detailing the benefits and potential drawbacks of participating in the study. After servers submitted their informed consent to their managers they were provided with a page of questionnaires to be completed at their convenience. These questionnaires included demographics, two measures of emotional expressivity (the FES and the ACT), and a measure of emotional receptivity (the ECS). Furthermore, servers were asked to identify their questionnaires through a personalized eight-digit identification number. The first four digits of this identification number were comprised of the last four digits of an individual's social security number. The last four digits were the month and year of the server's birthday. In order to assure anonymity, servers were instructed to place their questionnaires into envelopes provided by the research team and to seal these envelopes. After sealing the envelopes, servers gave them to research assistants.

Servers were asked to complete a brief measure of state affect (the SAM) immediately before interacting with each of their tables. In this manner, servers' state affect was assessed immediately prior to interacting with their customers. Optimally, the measures of state affect were to be filled out during the first work shift after a server had submitted their set of questionnaires. At the completion of their shifts, servers were asked

to submit each dining party's bill total and tip total, their pre-interactional measures of server's state affect and the corresponding customer satisfaction surveys. Furthermore, servers were asked to identify the data by indicating their eight digit personalized identification codes.

During the same shift in which servers identified each of their table's bills with the corresponding tip total and state affect, customers were presented with the aforementioned customer satisfaction survey. The survey and an envelope were presented to customers along with their bill. Customers completed a survey and left it in a sealed envelope on the table. The servers collected the customer evaluation surveys and wrote the corresponding check total, tip total, server identification number and pre-interactional state affect scores on the back of the envelope. Research assistants aided servers in this process.

At the conclusion of the study, participating servers and restaurant general managers will be invited to attend a seminar in which the results of this study will be presented. Furthermore, restaurant managers will be presented with the results of the customer satisfaction surveys collected at their restaurants.

Analyses

Hierarchical linear modeling. The analyses for Hypotheses 1, 2, and 3 utilized hierarchical linear modeling (HLM; Bryk & Raudenbush, 1987, 1992). HLM enables data to be analyzed in two levels: Level 1 analysis entails the use of repeated measures from each subject to estimate the parameters of a within-subject regression equation. On the other hand, second level HLM analysis involves accounting for the between-subject differences (i.e., between-subject variance of the level 1 analyses) displayed by the

within-subject models. To relate the first level of HLM analysis to the current study, a model describing the influence of every server's state affect on their customers' state affect was computed. An example of a second level HLM analysis that was conducted in the current study was the determination factors contributing to why some server's state affect impacts their customers' state affect more than other servers (i.e., Hypothesis 2).

Two first level analyses were conducted in the current study. First, to what extent was server X's customers' state affect (X_{Csa}) dependent on server X's state affect (X_{sa}) and customers' satisfaction with their service and food (C_{sr}), as assessed by the customer satisfaction ratings. This first within-subjects question can be portrayed in the following linear regression equation, which was computed for each individual server.

Customer $Mood_{ix} = B_{0x} + B_{1x}$ (customer satisfaction) $+ B_{2x}$ (servers' state affect) $+ U_{ix}$

B_{0x} is an average of server X's customers' state affect, B_{1x} represents the degree to which customers' satisfaction ratings were predictive of customers' state affect, B_{2x} represents the degree to which server state affect was predictive of customer state affect, and U_{ix} is a residual variance quotient. This repeated-measures regression equation was computed for each server. Once these equations were estimated, descriptive statistics for the entire sample (e.g., means, ranges, and variances for each of the betas) were computed and reported. In summary, this regression equation, which was computed for each individual server, indicated the degree to which each construct was predictive of

customers' state affect, as well as the degree to which emotional contagion is present across the sample of servers.

For two reasons, this analysis is not expected to demonstrate that statistically significant levels of emotional contagion occur between servers and their customers. First, the basic behaviors necessary for emotional contagion (transmission and reception) are individual difference variables. Thus, an averaging of within-subject variance is less likely to demonstrate significant emotional contagion effects across all servers. Second, the current study's methodology only assesses emotions transmitted from servers to their customers. This author believes that servers were also simultaneously "catching" their customers' moods as well. Thus, a significant amount of emotional contagion was not detected in the within-subject analyses. However, a high degree of variance was expected, suggesting that some servers' state affect would indeed be highly predictive of their customers' moods. The second level of HLM analysis, a between-subjects regression equation, determined the degree to which servers' state affect (as assessed by the SAM), servers' levels of emotional transmission (as assessed by the FES and the ACT), and servers' levels of emotional receptivity (as assessed by the ECS) was predictive of their customers' state affect.

Hypothesis 1. Hypothesis 1 predicted that emotional contagion would be present for those servers who are high in emotional transmission (FES). The following between-subjects linear regression equation was utilized to analyze this question.

B_{2x} = servers' state affect (SAM scores) + servers' facial expressivity (FES scores) + servers' emotional receptivity (ECS scores) + U_{ix}

In this equation B_{2x} represents the degree to which server state affect was predictive of customer state affect, as determined in the level 1 analysis. This between-subjects regression equation should indicate the factors that make it more or less likely for servers to influence their customers' affect. Thus, Hypothesis 1, which asserts that emotional contagion would be present for those servers reporting high levels of emotional transmission (e.g., high FES scores), was analyzed with the aforementioned between-subjects regression model.

Hypothesis 2. HLM was once again utilized to analyze the effects of emotional contagion on tipping. A new within-subjects model was estimated to account for the tip percentages received for each individual server.

$Tip_{ix} = B_{0x} + B_{1x}$ (server state affect) + B_{2x} (customer state affect) + B_{3x} (customer satisfaction ratings) + U_{ix}

B_{0x} is an average of server X's received tip percentage, B_{1x} represents the degree to which server X's pre-interactional state affect was predictive of customer tipping behavior, B_{2x} represents the degree to which server X's customers' post meal state affect was predictive of their tipping behavior, B_{3x} represents the degree to which server X's customers' satisfaction ratings of food and service quality were predictive of their tipping behavior, and U_{ix} is a residual variance quotient. This repeated measures regression equation, which was computed for each server, indicated the degree to which server pre-

interactional state affect, customer post meal state affect, and customer food and service satisfaction ratings were predictive of each servers' received tip percentage.

Hypothesis 2, which predicted that higher facial expressivity (FES), higher emotional receptivity (ECS), and intense, positive state affect (SAM) would be associated with higher tip percentages, was analyzed with second level HLM analyses. The impact of server X's state affect on their tips was expected to be a function of both the valence and intensity of their state affect and their degree of emotional expressivity. As such, this author anticipates a considerable degree of variability in the effect of server state affect across servers. The following regression equation will be utilized to determine the sources of between subject variability on the within server parameters determined in the first level of this analysis.

B_{2x} = servers' state affect (SAM scores) + servers' facial expressivity (FES scores) + servers' emotional receptivity (ECS scores) + U_{ix}

This between-subjects regression equation assessed the effects of emotional contagion on tip percentage. B_{2x} represents the combined effect of customers' state affect on the tip percentages customers left their servers, as determined by the first level HLM analyses. In summary, Hypothesis 2 predicted that higher levels of emotional transmission (as assessed by the FES), higher levels of emotional receptivity (as assessed by the ECS) and more positive state affect (as assessed by the SAM) would all be associated with higher tip percentages. Hypothesis 2 was tested with the aforementioned between-subjects regression equation.

Hypothesis 3. Hypothesis 3 predicts that customer affect mediates the relationship between contagion and tip percentage. In other words, those servers who were high in both emotional expressivity and emotional receptivity, and also reported positive state affect, were expected to receive higher tip percentages. However, the relationship between contagion and tip percentage was expected only to the degree that customer state affect was predictive of tip percentage. Thus, servers' emotional expressivity, emotional receptivity, and affective valence and intensity were expected to influence customer state affect, which in turn was expected to influence tip percentage.

Baron and Kenny (1986) indicated that three regression equations are sufficient to demonstrate mediation (p. 1177). More specifically, Baron and Kenny (1986) reported that

> To establish mediation, the following conditions must hold: First, the independent variable must affect the mediator in the first equation; second, the independent variable must be shown to affect the dependent variable in the second equation; and third, the mediator must affect the dependent variable in the third equation. If all these conditions hold in the predicted direction, then the effect of the independent variable on the dependent variable must be less in the third equation than in the second. (p. 1177)

Thus, to demonstrate Baron and Kenny's (1986) standard of mediation in the current study, three sets of relationships must be demonstrated. First, the independent variables (servers' levels of emotional expressivity, receptivity, and state affect) should affect the mediator (customer state affect) in the first equation. Second, the independent variables (servers' levels of emotional expressivity, receptivity, and state affect) should affect the dependent variable (tip percentage). Finally, the mediator (customer state affect) should affect the dependent variable (tip percentage). Such a set finding would be consistent with the notion that customer affect mediates the relationship between

contagion and tip percentage. Each of these regression analyses were conducted as part of the previously described HLM analyses.

Research Question 1. Research Question 1 was designed to assess the construct validity of the FES and the SAM. Research Question 1 predicted that individuals who scored highly on both the FES and the SAM would also score highly on the ACT. Such a finding would be consistent with the notion that the ACT distinguished between those individuals who tended to express positive emotions and those who did not. A multiple regression analysis was conducted to determine the degree to which the FES and SAM were predictive of ACT scores. The predictor variables were scores on the FES and the SAM as well as the FES X SAM interaction. It was anticipated that the p level and r-square of the model, rather than of specific predictors, would provide the best overall estimate of the degree to which high FES and SAM scores predict high ACT scores, because the overall model includes estimates of both additive and multiplicative effects of FES and SAM on ACT scores.

Research Question 2. Research Question 2 was designed to determine the degree of association between the ACT and the FES, ECS, and the SAM. As a result, three zero-order Pearson correlations were conducted. More specifically, ACT scores were correlated with FES scores, with ECS scores, and with SAM scores.

Research Question 3. Research Question 3 predicted that the tip percentages received by high ACT scorers would mimic the tip percentages received by emotional transmitters (high FES scorers) displaying positive state affect (SAM). ACT scores have been conceptualized to represent one's tendency to emit positive affect (Friedman et al., 1980). As such, tip percentages for high ACT scorers should mimic those for

participants' with high facial expressivity (FES) who demonstrate positive affect (e.g., positive SAM scores). A Pearson correlation was conducted to determine the degree of association between ACT scores and tip percentage.

CHAPTER 4
RESULTS
Data Profile

Of the 40 servers who agreed to participate in the study, 35 recorded sufficient levels of within-subject data (data from at least 3 dining parties) to be included within the Level 1 HLM models. Two servers were erroneously assigned the same identification numbers, rendering their data indistinguishable from each other, and thus unusable. Three servers recorded data on fewer than three dining parties, therefore their data were unable to be incorporated into the HLM analyses. The 35 remaining servers collected at least partial data on a total of 280 dining parties. Servers reported complete data (i.e., ratings of pre-interactional state affect, check total and tip total) for 266 of the 280 dining parties (95%). Customers completed a total of 231 (or 83%) of their customer satisfaction surveys. This yielded complete data for 226 dining parties across the 35 servers, or 81% of the cases. Thus, the criterion of complete Level 1 data for the 222 dining parties needed to attain sufficient levels of statistical power was exceeded. Furthermore, as incomplete data sets can also be included in Level 1 HLM analyses, there were usually considerably more than 226 responses for each item.

Server compliance on the Level 2 data was also high, as all of the 35 eligible servers participating in this study completed their Level 2 questionnaires (e.g., ECS, FES, ACT, and demographics). Descriptive statistics for all variables used in these

Table 4.

Descriptive statistics for Level 1 data

	M	SD	Min	Max
Number of dining parties waited on	5.17	3.27	1.00	14.00
Server's affective valence	3.74	0.92	1.00	5.00
Server's affective intensity	3.33	0.93	1.00	5.00
Server's affective index	12.73	5.24	1.00	25.00
Check total	39.61	32.68	7.83	326.50
Tip total	7.18	6.06	0.00	50.00
Tip percentage	19.16	9.85	0.00	113.19
Appear of food	4.53	0.64	2.00	5.00
Taste of food	4.59	0.61	2.00	5.00
Price of food	4.09	0.80	1.00	5.00
Food index	13.18	1.65	7.00	15.00
Promptness of server	4.75	0.57	1.00	5.00
Friendliness of server	4.84	0.44	2.00	5.00
Attentiveness of server	4.71	0.61	2.00	5.00
Server index	14.30	1.39	7.00	15.00
Customer's affective valence	4.45	0.72	1.00	5.00
Customer's affective intensity	4.02	0.82	1.00	5.00
Customer's affective index	18.02	5.31	3.00	25.00

Table 5.

Descriptive statistics for Level 2 data

	M	SD	Min	Max
Age	22.51	3.93	19.00	42.00
Total serving experience (in months)	32.53	21.83	3.00	98.00
Serving experience at current restaurant	12.41	8.53	1.00	30.00
ECS total score	51.27	7.58	33.00	68.00
FES total score	33.56	6.17	17.00	45.00
ACT total score	39.00	9.25	18.00	56.00

analyses are presented in Tables 4 and 5. For the sake of clarity, descriptive statistics for Level 1 and Level 2 data are presented separately.

Of the 35 servers who recorded data for three or more dining parties, 32 (or 91%) were Caucasian, and 3 (or 9%) were Latino. The average age of the servers was 22.51 years (SD=3.93), with minimum and maximum ages of 19.00 and 42.00 years, respectively. The average number of months the sample of servers had waited tables was 32.53 (SD=21.83), whereas the average number of months the sample of servers had waited tables at their current place of employment was 12.41 (SD=8.53). Finally, 132 (47%) customers were recruited from Restaurant 1, 116 (41%) were recruited from Restaurant 2, and 36 (13 %) were recruited from Restaurant 3.

Scores on each variable were plotted on histograms in order to examine for skewness and kurtosis in the distributions. Customers' cognitive ratings of food and service, as well as their self-reports of affective valence, were too negatively skewed to

be included in the Level 1 HLM analyses (customers tended to provide maximally positive responses for food quality, service quality, and their affective valence). As a result, these variables were transformed into Z-scores to normalize their distributions. All other Level 1 variables (i.e., servers' affective valence, affective intensity, total affective index, check total, tip total, tip percentage, customer affective intensity, and customer affective index) were approximately normally distributed items.

Reliability analyses were conducted on the ECS, the FES, and the ACT. Each scale demonstrated sufficiently high Cronbach alphas (ECS alpha = .81, FES alpha = .74, and ACT alpha = .82), suggesting that items on each of the three measures were strongly positively correlated with the corresponding scale's total scores. Additional analyses indicated that the deletion of any item on any of the three scales would not have significantly increased the alpha of that particular scale. In summary, the ECS, the FES, and the ACT all appear to be sufficiently reliable measures for this sample.

Predictors of Customer Post Meal State Affect

The first goal of these analyses was to determine the extent to which customer state affect (X_{Csa}) was related to their server state affect (X_{sa}) and their satisfaction ratings of service and food (C_{sr}). This first within-subjects question is reflected in the following linear regression equation, which was computed for each individual server (see Analyses section for a description of each HLM model).

Customer State $\text{Affect}_{ix} = B_{0x} + B_{1x}$ (customer satisfaction) $+ B_{2x}$ (servers' state affect) $+ U_{ix}$

This repeated-measures regression equation was computed for each server. However, because of the restricted variance of the customer satisfaction ratings, these items were subsequently removed from the analyses. Thus, the equation was modified:

$$\text{Customer State Affect}_{ix} = B_{0x} + B_{1x} \text{ (servers' state affect)} + U_{ix}$$

Results suggested that although the intercept (i.e., B_{0x}) was significantly predictive of customer state affect ($\underline{r} = .18$, $\underline{p} = .01$), server's pre-interactional state affect was not ($\underline{r} = 0.42$, $\underline{p} = .47$). These findings indicate that whereas each server's customers tended to have distinct average affective states across servers, neither server state affect, nor customer ratings of food and service were predictive of customer state affect. The lack of variance of the cognitive ratings, and the fact that customer state affect is not related to server state affect, both pose problems for the originally intended analyses. These constraints will be discussed as appropriate.

Hypothesis 1 predicted that emotional contagion would be present for those servers who are high in emotional transmission (FES). The following between-subjects linear regression equation was to be utilized to analyze this question.

$$B_{2x} = \text{servers' state affect (SAM scores)} + \text{servers' facial expressivity (FES scores)} + \text{servers' emotional receptivity (ECS scores)} + U_{ix}$$

However, B_{2x}, which represents the degree to which servers' state affect was predictive of customers' state affect, was not found to vary significantly across servers.

As a result, conducting a Level 2 HLM analysis to explain the sources of B_{2x}'s variance would be inappropriate. Therefore, Hypothesis 1, which asserted that emotional congruence would be present for those servers reporting high levels of emotional transmission (e.g., high FES scores), could not be tested, and as a result, was not supported.

The statistically significant Level 1 intercept suggests that each server's customers tended to have distinct average state affects across servers. Level 2 analyses were conducted to determine if any of the Level 2 variables employed in the study predicted customers' affective variance across servers. The following between-subject variables were entered into Level 2 HLM models to predict the within-subject variance; ACT total score, FES total score, ECS total score, ECS x ACT total score, ECS x FES total scores, FES x ACT total scores, ECS x FES x ACT total scores, total serving experience, serving experience at current place of employment, and the gender of each server. The only variable accounting for even marginally significant variance was servers' FES scores ($r = -0.10$, t value = - 1.73, $p = 0.09$). Surprisingly, this result was in the opposite direction than predicted, suggesting that expressive servers tended to have unhappy customers. This finding is contrary to the expected influence of FES scores, and suggests that customers are more interested in being served than "entertained."

An analysis of covariance (ANCOVA) was conducted to determine if there was an interaction between facial expressivity (FES scores) and restaurant, such that servers' reported levels of facial expressivity were more predictive of customers' self-reports of state affect in some restaurants more than others. As restaurant was a categorical variable with only three levels, an ANCOVA was determined to be the appropriate statistical

procedure with which to examine this post hoc hypothesis. The dependent variable in this ANCOVA model was each server's customers' mean affective valence, the primary categorical factor was restaurant, and the covariate factor was servers' FES scores. Results indicated that whereas the corrected model did not account for a significant portion of variance ($F = 2.06$, $p = .13$), there was a significant main effect of FES scores ($F = 4.37$, $p = .04$), and a nonsignificant effect for restaurant ($F = .86$, $p = .43$). Furthermore, there was a marginally significant interaction between restaurant and FES scores ($F = 2.54$, $p = .10$).

Zero order correlations were then conducted between FES scores and customers' self-reports of state affect for the three participating restaurants. Significant correlations between facial expressivity (FES) and customer state affect (SAM) were found in restaurants 1 ($r = -.25$) and 2 ($r = -.17$), but not in restaurant 3 ($r = .00$). Mean check averages for the three restaurants were also examined. Restaurant 1's mean check average was $28.85, Restaurant 2's mean check average was $37.03, and Restaurant 3's mean check average was $90.97. Thus, it was hypothesized that the cheaper the meal, the less positively customers responded to expressive servers. A multiple regression was conducted to determine the validity of this hypothesis. Centered check total and centered FES scores were regressed against customer affective valence and two significant main effects were demonstrated; ($t = -2.03$, $p = .05$) and ($t = -2.41$, $p = .02$) respectively. The interaction of centered check total and centered FES scores on customer affective valence was not significant ($t = 1.26$, $p = .22$). Thus, it appears as though check total does not account for the previously noted discrepancy between server expressivity (FES) and customer affective valence when taking into account the specific restaurant.

Predictors of Customer Tip Percentage

In order to assess Hypothesis 2, both within-subjects and between-subjects analyses were conducted. The following within-subjects model was expected to account for significant variance in the tip percentages received by each individual server.

$Tip_{ix} = B_{0x} + B_{1x}$ (server state affect) + B_{2x} (customer state affect) + B_{3x} (customer satisfaction ratings) + U_{ix}

This repeated measures regression equation was computed for each server in order to indicate the degree to which each server's pre-interactional state affect, customers' post meal state affect, and customers' food and service satisfaction ratings were predictive of each server's received tip percentage. Once again, because customer food and satisfaction ratings were severely skewed, these items were excluded from the analyses. Thus, the following modified HLM model was computed.

$Tip_{ix} = B_{0x} + B_{1x}$ (server state affect) + B_{2x} (customer state affect) + U_{ix}

As expected, this equation demonstrated a significant fixed effect, suggesting that the mean tip percentage was significantly different from zero ($t = 28.76$, $p = 0.01$). However, tip percentage did not display reliable variance across servers (Chi-square = 29.88, $p = 0.32$). Additionally, neither server state affect ($t = 0.64$, $p = 0.53$), nor customer state affect (t ratio = 1.31, $p = 0.20$), were significantly predictive of tip percentages. In summary, Level 1 HLM analyses indicated that tip percentage did not

vary significantly across servers, and neither servers' self reports of state affect, nor customers' reports of post-meal state affect were significantly correlated with tip percentage.

Hypothesis 2 predicted that higher facial expressivity (FES), higher emotional receptivity (ECS), and intensely positive state affect (SAM) would all be associated with higher tip percentages. The following Level 2 HLM equation was to be utilized to determine the sources of between subject variability on the within-server parameters determined in the first level of this analysis.

B_{2x} = servers' state affect (SAM scores) + servers' facial expressivity (FES scores) + servers' emotional receptivity (ECS scores) + U_{ix}

However, B_{2x} represents the degree to which customer state affect was predictive of tip percentage, as determined in the Level 1 HLM analyses. As this effect was not found to vary across servers, a Level 2 HLM analysis to explain the source of B_{2x}'s variance would, as before, be uncalled for. Therefore, Hypothesis 2, which predicted that higher facial expressivity (FES), higher emotional receptivity (ECS), and intensely positive state affect (SAM) would all be associated with higher tip percentages, was not testable, and therefore not supported.

The Mediating Role of Customer State Affect on Tip Percentages

Hypothesis 3 predicted that customer affect would mediate the relationship between contagion-related variables (i.e., servers' reported levels of emotional

transmission, emotional receptivity, and state affect) and tip percentage. In other words, those servers who reported high levels of both emotional expressivity and emotional receptivity, and also reported positive state affect, were expected to receive higher tip percentages than others (see Table 2). Hypothesis 3 also suggested that the relationship between contagion and tip percentage was to be expected only to the degree to which customer state affect was actually predictive of tip percentage. A Pearson correlation was conducted to determine the relationship between customers' affective index and their tipping percentages. The coefficient was demonstrated to fall just short of conventionally accepted alpha levels ($r = .31$, $p = .07$). Although this finding is not significant, for exploratory purposes the author decided nonetheless to utilize Baron and Kenny's (1986) approach to determining whether customers' state affect mediated the not-quite-significant relationship between tipping and contagion.

As indicated previously, three sets of relationships must be demonstrated in order to meet Baron and Kenny's (1986) standard of mediation (See Analyses section for a complete explanation of Baron and Kenny's (1986) standard of mediation). First, a regression equation was conducted to determine if the independent variables (servers' levels of emotional expressivity, receptivity, and state affect) were associated with the mediator (customer state affect). This relationship approached significance ($r = 0.47$, $p = 0.09$). It is noteworthy that a correlation of 0.47 merely approached significance, and suggests that this study utilized an insufficient server sample size to detect the desired within-subject effects. The second relationship required to demonstrate mediation is that the independent variables (servers' levels of emotional expressivity, receptivity, and state affect) should have affected the dependent variable (tip percentage). This result was not

demonstrated ($r = 0.21$, $p = 0.85$). The final regression equation required to demonstrate the mediating effect of customer state affect is that the mediator (customer state affect) must affect the dependent variable (tip percentage). This result also approached significance ($r = 0.31$, $p = 0.07$). Thus, whereas servers' levels of emotional transmission, receptivity, and state affect were marginally predictive of customer state affect, and customer state affect was marginally predictive of tip percentage, servers' levels of transmission, receptivity, and state affect were not predictive of the tips they received. In summary, Hypothesis 3, which posited that customer affect would mediate the relationship between contagion-related variables and tip percentage, was not supported.

Investigating the ACT

Research Question 1, which assessed the construct validity of the ACT, predicted that individuals who scored highly on both the FES and the SAM would also score highly on the ACT. Such a finding would be consistent with the notion that the ACT distinguishes between those individuals who tend to express positive emotions and those who do not. A multiple regression analysis indicated that servers' FES and SAM scores were significantly correlated with their ACT scores ($r = .72$, $p < 0.01$). Zero order correlations were also conducted to determine the degree of association between the ACT and the FES ($r = .72$, $p = 0.01$), and the SAM ($r = -.17$, $p = 0.32$). The regression model was not more predictive than the individual correlation between the ACT and the FES. In summary, it appears reasonable to assume that the ACT was not a good indicator of servers' tendencies to report feeling positively, whereas it was highly correlated with a measure of general facial expressivity (the FES).

Research Question 2 was designed to determine the degree of association between the ACT and the FES, ECS, and the SAM. As a result, three zero-order Pearson correlations were conducted. The correlations between the ACT and the FES (r = .72, p = 0.01) and the ACT and the SAM (r -.17, p = 0.32) were previously reported with regard to Research Question 2. The correlation between the ACT and the ECS fell just short of statistical significance (r = .32, p = 0.06). This suggests that perhaps with the utilization of a larger sample, one's tendency to express positive affect and one's tendency to catch the emotions of another would likely be significantly correlated.

Research Question 3 predicted that the tip percentages received by high ACT scorers would mimic the tip percentages received by emotional transmitters (high FES scorers) displaying positive state affect (SAM). Pearson correlations indicated that neither the servers' FES scores (r = .01, p = .95), nor their ACT scores (r = .10, p = .56) were correlated with their tip percentages. Thus, these two measures of emotional expressivity both demonstrated nonsignificant correlations with tipping behavior, perhaps suggesting that expressiveness is too general a construct to accurately predict tipping behavior.

Ancillary Analyses

As a result of the restricted variance of several crucial variables (customer affective valence and customer ratings of food and service), several hypotheses were not able to be properly addressed with the initially selected HLM analyses. Thus, additional exploratory analyses of the data set were conducted. In particular, a correlation matrix was computed to better understand relationships between the variables. Whereas this

approach may elevate the likelihood of Type 1 error through the "fishing" technique, it can also serve to clarify the data set. Numerous significant correlations were identified, and important patterns in the data were extrapolated.

Several significant correlations suggested that emotional congruence (and perhaps emotional contagion) may have been evidenced between servers and their customers. Server affective index (valence X intensity) approached significance with customer affective index ($r = .31$, $p = .07$). Servers' ratings of affective valence were positively correlated with customers' ratings of affective intensity ($r = .35$, $p = .04$). It is intriguing that server affective valence was significantly correlated with customer ratings of affective intensity. Whereas there may be numerous explanations for this finding, one that appears plausible based on correlational data as well as limited qualitative data, is that individuals did not tend to clearly differentiate between valence and intensity of affect. More specifically, customers' affective valence and intensity were moderately correlated ($r = .47$, $p = .01$). Additionally, server affective valence also approached significance with customer affective index ($r = .29$, $p = .08$). These correlations provide modest support for the hypothesis that emotional congruence was demonstrated between servers and their customers.

Correlational data demonstrated a clear and consistent relationship between Z-score transformations of customers' cognitive appraisals of food and service and customers' self-reports of state affect. In fact, this relationship was the most consistent finding in the data set. Generally speaking, the majority of customers' cognitive appraisals of food (appearance, taste, price, and the overall food index) and service (friendliness, attentiveness, promptness, and the overall service index) were significantly

correlated with customers' ratings of affect (e.g., affective valence, affective intensity, and affective index). Specifically, customers' ratings of affective valence were positively correlated with 7 out of 8 possible cognitive appraisals of food and service. Customers' ratings of affective intensity were significantly correlated with 6 out of 8 possible cognitive appraisals. Finally, customer affective index (affective valence X affective intensity) was significantly correlated with 5 out of 8 possible cognitive appraisals. Table 6 provides a correlation matrix demonstrating the relationships between cognitive appraisals and affective ratings.

Clearly, one possible explanation for the consistent significant correlations between cognitive ratings of satisfaction and customer state affect is that these variables were only correlated as a result of their restricted ranges of variance. However, when the Z score transformations were conducted, these correlations persisted.

This study's methodology required that customers report their state affect immediately after providing satisfaction ratings of food and service. Thus, perhaps customers responded to all eight items on Appendix A as if they were representative of the same construct. In order to address this post hoc hypothesis, a maximum likelihood factor analyses with varimax rotation was conducted. The eight variables on Appendix A (i.e., customers' ratings of the appearance, taste, and price of their food, their ratings of the promptness, friendliness, and attentiveness of their server, as well as their ratings of affective valence and intensity) were included in the factor analysis. This analysis yielded two factors with eigenvalues greater than 1. Factor 1 had an eigenvalue of 3.41 and accounted for 42.62% of the variance. This factor was highly correlated with all 8 variables. A second factor existed which demonstrated a small eigenvalue of 1.34 that

accounted for 16.81% of the variance. This factor was affective valence and intensity, but was negatively correlated with the three cognitive ratings of service. Stated differently, this maximum likelihood factor analysis supports the post hoc hypothesis that customers did not distinguish clearly between state affect and cognitive appraisals of food and service.

In order to determine if the items comprising Appendix A functioned as an effective unidimensional scale, a reliability analysis was conducted on cognitive ratings of food and service, as well as customers' self-reports of state affect. The alpha level of this 8-item "measure" was 0.80, and the standardized item alpha was 0.81. All items were positively correlated with each other. The inter-item correlations ranged from a minimum of 0.16 to a maximum of 0.64. The average inter-item correlation was 0.34, and the deletion of any one item would not serve to significantly increase the measure's overall alpha. Thus, these findings appear to suggest that the eight variables included in Appendix A assess one large variable consisting of both cognitive ratings and affective self-reports.

A surprising and somewhat counterintuitive set of relationships existed between the three measures of emotional contagion variables (ECS, FES, and ACT) and other variables assessed within this study. A consistent negative relationship was demonstrated between the two measures used to assess emotional expressiveness (the FES and the ACT) and customer affective valence ($r = -.34$, $p = .04$, and $r = -.42$, $p = .01$), respectively. Furthermore, the ECS was negatively correlated with customer ratings of affective intensity ($r = -.34$, $p = .04$) and customers' overall affective index ($r = -.39$, $p = .02$). The counterintuitive component of these findings is that the ECS, the FES, and the

ACT were all negatively correlated with measures of customer state affect, suggesting that high levels of both emotional expressiveness and receptivity resulted in customers having poorer mood states.

Finally, a multiple regression analysis was conducted to determine the factors that tip percentage was uniquely correlated with. The correlation matrix demonstrated that tip percentage was significantly correlated with check total ($r = -.35$, $p = .04$), and was marginally correlated with customer affective index ($r = .31$, $p = .07$). These variables were entered into a multiple regression equation in order to determine if the negative correlation between check total and tip percentage was actually a result of the fact that the customers were unhappy due to the expense of their meal. Thus, tip percentage was entered as the dependent variable, and check total and customer affective index were entered as the independent variables. The overall regression model was significant ($F = 4.32$, $p = .01$). Additionally, there were two individual effects on tip percentage. First, check total was found to be marginally negatively correlated with tip percentage ($t = -1.74$, $p = .08$) when taking into account the effect of customer state affect. Second, customer state affect was demonstrated to be significantly correlated ($t = 2.20$, $p = .03$) with tip percentage, when accounting for the effect of check total on tip percentage. Thus, it was demonstrated that customer state affect actually has a more powerful effect on tip percentage than does check total.

Table 6.

Intercorrelations between customers' cognitive ratings of satisfaction and their self-reports of state affect

	Food Appearance	Taste of Food	Price of Meal	Index of Food Quality	Promptness of Service	Friendliness of Server	Attentiveness of Server	Index of Service Quality
Food Appearance	r --	.49**	.30	.70**	.48**	.22	.26	.39*
	p	.01	.08	.01	.01	.20	.13	.02
Taste of Food		--	.24	.53**	.13	-.08	.08	.06
			.16	.01	.47	.65	.63	.72
Price of Meal			--	.74**	.47**	.20	.10	.32
				.01	.01	.25	.56	.07
Index of Food Quality				--	.56**	.04	.37*	.41**
					.01	.83	.03	.01
Promptness of Service					--	.44**	.57**	.83**
						.01	.01	.01
Friendliness of Server						--	.69**	.81**
							.01	.01
Attentiveness of Server							--	.89**
								.01
Index of Service Quality								--
Customer Affective Valence								
Customer Affective Intensity								

n = 226.

Note. Correlation coefficients appear in the upper left corners and probabilities appear in the lower right corners.

**. Significant at the 0.01 level

*. Significant at the 0.05 level

Table 6 (cont.).

Intercorrelations between customers' cognitive ratings of satisfaction and their self-reports of state affect

	Customer Affective Valence	Customer Affective Intensity	Customer Affective Index
Food Appearance	.46** .01	.38* .02	.31 .06
Taste of Food	.49** .01	.00 .98	.12 .47
Price of Meal	.22 .19	.04 .80	.13 .44
Index of Food Quality	.49** .01	.39* .02	.39* .02
Promptness of Service	.40* .02	.35* .04	.36* .03
Friendliness of Server	.35* .04	.40* .02	.36* .03
Attentiveness of Server	.44** .01	.54** .01	.50** .01
Index of Service Quality	.47** .01	.51** .01	.48** .01
Customer Affective Valence	--	.47** .01	.60** .01
Customer Affective Intensity		--	.83** .50

n = 226.

Note. Correlation coefficients appear in the upper left corners and probabilities appear in the lower right corners.

**. Significant at the 0.01 level

*. Significant at the 0.05 level

CHAPTER 5
DISCUSSION

This discussion section will first describe the results of the hypothesis tests and ancillary analyses. Second, limitations of the study and suggestions for future research will be discussed. Finally, the implications for both emotional contagion research and tipping behavior research will be considered.

Hypothesis Tests

Hypothesis 1, which predicted that emotional contagion would be present for those servers who are high in emotional transmission, was not supported. It was anticipated that expressive servers would be more likely than inexpressive servers to "infect" customers with their pre-meal state affect. This finding was expected because those individuals who are more expressive should display a greater overall number of expressions to be mimicked, and, in turn, "caught." In summary, this study did not demonstrate that expressive servers were significantly more likely than nonexpressive servers to transmit their moods to their customers.

Hypothesis 2 predicted that higher facial expressivity, higher emotional receptivity, and intensely positive state affect would all be associated with higher tip percentages. However, the extent to which customers' state affect was predictive of the tip percentages they left their servers was not found to vary reliably across servers. This lack of variance in the degree to which customers' state affect was predictive of their tip percentages prevented Hypothesis 2 from being tested, let alone supported. One possible

explanation for this lack of variance might be the restrictive effect of cultural influences on tipping (i.e., the 15% rule). However, as other studies have demonstrated factors that are predictive of tipping variance (e.g., Cunningham, 1979; and Lynn & Mynier, 1993), this explanation seems unlikely. Alternate explanations for this finding will be discussed subsequently.

Hypothesis 3 predicted that customers' affective valence and intensity would mediate the relationship between contagion-related variables (i.e., emotional transmission, emotional receptivity, and state affect) and tip percentage. More specifically, it was anticipated that those servers who were high in their self-reported tendencies to both transmit (i.e., FES and ACT) and receive affect (i.e., ECS), and also reported intensely positive state affect (i.e., SAM), would receive higher tip percentages than other servers. Baron and Kenny's (1986) aforementioned approach to determining mediation was utilized. Whereas a marginal relationship was demonstrated between customer state affect and tip percentages, customer affect did not mediate the relationship between contagion related variables and tip percentage. More specifically, servers' levels of contagion related variables were not significantly correlated with tip percentages.

Research Question 1 predicted that individuals who scored highly on the FES and SAM would also score highly on the ACT. As previously reported, the results of the current study suggested that whereas the ACT was significantly correlated with another measure of emotional transmission (i.e., the FES), it was not correlated with customer state affect (i.e., the SAM). The ACT appears to measure a stable personality trait, whereas the SAM claims to assess fleeting, moment-to-moment state affect. Thus, it is not surprising that state affect (the SAM) was not significantly correlated with the ACT, a

measure of one's tendency to express positive affect, which presumably is a stable personality trait.

Research Question 2 examined the degree to which the ACT correlated with the FES, the ECS, and the SAM. The ACT was demonstrated to correlate significantly with the FES, correlate marginally with the ECS, and to be uncorrelated with the SAM. The fact that the ACT, correlated with FES and ECS may suggest at least one common source of variance (i.e., a third variable). This common source of variance between measures of emotional expressivity and emotional receptivity may be the result of one's general tendency to be emotional. Klein and Cacioppo (1993) demonstrated that the FES and ECS were moderately correlated with Eysenck and Eysenck's (1968) measure of introversion/extraversion. However, both the current study and Klein and Cacioppo's (1993) study demonstrated a substantial enough discrepancy between scores on these two constructs that one could not safely assume that the three measures (i.e., ACT, FES, and ECS) exclusively assess an identical construct.

Research Question 3 predicted that the tip percentages received by high ACT scorers would mimic the tip percentages received by emotional transmitters (i.e., high FES scorers) displaying positive state affect (SAM). As previously reported, neither servers' FES x SAM scores nor their ACT scores were predictive of variance in tip percentages. Thus, the two measures were similarly ineffective in their ability to receive tip percentages received by individual servers.

Ancillary Analyses

Numerous ancillary analyses were conducted to better understand the data collected within this study. These results will now be discussed in greater detail.

Evidence supporting the presence of emotional contagion and/or congruence. Customer affective index and server affective index were marginally correlated. Stated more simply, servers' self-reports of pre-interactional state affect were somewhat predictive of customers' self-reports of post-meal affect. Thus, congruence was marginally demonstrated. However, a correlation between customer and server state affect implies nothing about the causation of the correlation. In other words, additional information suggesting causality is required to determine if the processes of contagion caused the demonstrated congruence. A relationship between contagion-related variables (i.e., servers' FES, ECS, ACT, and SAM scores) and customers' state affect (i.e., SAM scores) was demonstrated in this study and provides marginal indication that contagion may have caused the demonstrated congruence. Whereas, previous applied contagion research (i.e., Verbeke, 1997) relied exclusively on this nonexperiemental design in determining the presence of contagion, this author does not believe that the results conclusively support the contagion hypothesis.

Customer affect as a function of the particular server. Whereas HLM analyses did not demonstrate a relationship between servers' self-reports of state affect and customers' self-reports of state affect, the analyses did demonstrate that customers' moods varied reliably depending on who their server was. Numerous variables were utilized in Level 2 HLM analyses to determine the source of this effect. The only variable that was even marginally predictive of the effect was servers' self-reports of expressiveness (i.e., FES scores). In other words, the more expressive a server was, the less happy their customers tended to be. Intriguingly, this result was only demonstrated within two of the three participating restaurants. Since the two restaurants that demonstrated the result had

distinctly lower check averages than the restaurant which did not demonstrate the effect, post hoc speculation was made regarding the effect of check total on the relationship between server expressivity and customer state affect. Ancillary statistical analyses did not support the post hoc hypothesis that customers tended to be annoyed by expressive servers when their meal was relatively inexpensive, whereas they were more accepting of expressive servers when their meal was more expensive. In summary, these findings suggest that server expressiveness was never beneficial, and was frequently detrimental.

Other analyses also demonstrated that servers' scores on measures of contagion-related variables (i.e., FES, ACT, and ECS) displayed unexpected relationships with customers' self-reports of state affect. Zero order correlations were conducted between the measures of emotional expressivity (i.e., the FES and the ACT), receptivity (i.e., the ECS) and customers' reports of state affect (i.e., the SAM). Surprisingly, the contagion-related variables were all negatively correlated with customers' self-reports of state affect. These findings may suggest that customers tended to respond unfavorably to emotional interaction. Regardless of the mechanism, the findings are clearly distinct from the expected effects, and suggest that the relationship between an individuals' tendency to express and receive affect is more complicated than previously believed.

Unidimensional outcome variables. It was anticipated that customers' cognitive self-reports of satisfaction with service and food quality would both be distinct from the customers' self-reports of post-meal state affect. However, as previously reported, the outcome variables appear to represent a unidimensional outcome variable. This unidimensional outcome variable may have incorporated a general attitude toward one's dining experience.

Predictors of tip percentage. This study failed to demonstrate a relationship between contagion-related variables and tip percentage (i.e., Hypotheses 2 and 3). Zero order correlations were conducted to determine the variables that were significantly related to tip percentage. As previously reported in the Results section, only check total was significantly correlated with tip percentage, whereas customer affective index was marginally correlated with tip percentage. Additional analyses were conducted to determine if the negative correlation between tip percentage and check total was actually the result of a higher order relationship between customer state affect and tip percentage. Results indicated that these two correlations represent independent effects and that customer affective index was actually more strongly associated with tip percentage than was check total. Stated differently, the more costly an individual's meal was, the lower the tip percentage they tended to leave their server. Conversely, the happier the customer was, the higher the tip percentage they tended to leave their server. Thus, the relationship between check total and tip percentage was not demonstrated to be a result of the fact that customers reported negative state affect when they had to pay for an expensive meal.

Limitations and Suggestions for Future Research

None of this study's three central hypotheses were statistically supported by the initial statistical procedures employed. One potential explanation for this lack of significant findings is that the hypotheses were invalid. However, prior to making these assumptions one must examine alternate explanations for the lack of findings. More specifically, it is likely that some facet or facets of the specific applied context, research methodology, or instrumentation resulted in this study's failure to demonstrate its three primary hypotheses. Several limitations providing potential alternate explanations for the

lack of findings will now be discussed in greater detail, along with suggested future directions of emotional contagion research.

Two methodological factors clearly served to limit the likelihood of emotional contagion. First, the methodology employed in this study was only capable of measuring the transmission of affect from server to customer. However, it also appears likely that customers transmitted their moods to servers. Thus, it is conceptually reasonable to believe that at least twice as much contagion took place than was actually assessable within the current study's methodology. In order to appropriately assess the direction of the transmission of affect, both customers and servers would need to report their state affect at least two times, as well as to complete measures of expressivity (FES) and receptivity (SAM).

An additional methodological limitation that likely reduced the amount of demonstrated contagion is the manner in which emotional contagion was operationalized. More specifically, contagion was operationalized by the degree to which customers' post-meal affect was similar to servers' pre-interactional state affect. However, emotional contagion has only been demonstrated to influence fleeting, moment-to-moment state affect, <u>not</u> longer-term mood states. Perhaps the lengthy delay (1-2 hours) between the assessment of servers' and customers' state affect at least partially accounts for the lack of demonstrated contagion. In other words, servers interacted with their customers' multiple times over their dining experience, thereby providing numerous opportunities for contagion. However, the current methodology was only suited to detect primacy effects in its operationalization of contagion. In order to determine the duration of the

contagion effect, future contagion research would be well served to vary the period of time between the assessment of the two individuals' affective states.

A third possible alternate explanation for the lack of demonstrated contagion is that contextual variables may have reduced the likelihood of emotional contagion. Customers' post-meal ratings of affect were negatively skewed and evidenced a restricted range of variance, such that most customers reported that they were very happy at the conclusion of their meal. Conversely, servers' pre-interactional reports of state affect were not subject to the same degree of contextual priming, and thus were not negatively skewed. Simply stated, servers reported a wider range of state affect than their customers, as would be expected due to the vagaries of their moment-to-moment job experiences (e.g., the disposition of the customer they were just interacting with, the size of a tip they just received, or their immediate stress level).

Previous research has demonstrated that emotional contagion is a subtle process and is more likely to influence individuals' affect in ambiguous conditions in which they do not have other strong predictors of emotion (Hatfield et al., 1994). In retrospect, it appears likely that these contextual influences on servers' and customers' reports of state affect may have obfuscated the contagion effect. Thus, this study's inability to demonstrate contagion may be the result of the relatively small magnitude of the contagion effect size as compared to the larger effect size of contextual predictors of emotion. A line of research that would benefit future applied studies would be to conduct internally valid studies that more clearly identify the influence of various contexts on likelihood of contagion, thus determining the relative likelihood of contagion within different settings.

A final limitation of this study is that between-subject analyses were based on relatively insufficient data points (n = 35). It is likely that the low number of servers employed in this study influenced the outcomes of this study's analyses. For example, servers' self-reported levels of contagion-related variables (i.e., ECS, FES, ACT, and SAM) were regressed against customer state affect (i.e., SAM). The moderate result (r = .47) only approached statistical significance (p = .09). This would be an important finding if significant, as it would validate Verbeke's (1997) assertion that contagion related variables do influence customer state affect, and would provide further support for the validity of the contagion hypothesis. However, due to the limited sample size and degrees of freedom, a moderate effect size (r = .47) was determined to be only marginally significant. Future studies would be well served to reexamine this issue utilizing a larger number of between-subject participants (i.e., servers).

This author believes that all of the aforementioned limitations may provide alternate explanations accounting for the lack of demonstrated contagion, and must be examined before indicating that contagion does not occur between servers and their customers. The current methodology simply allowed for too many alternate explanations for customers' self-reports of post-meal state affect to conclusively address the contagion hypothesis.

Implications

Despite the fact that many of this study's central questions were neither addressed nor supported, insights can be drawn from this study and applied to research in both emotional contagion and tipping behavior. For example, no previous research on tipping has directly examined the relationship between customer state affect and their tipping

behavior. Whereas numerous studies (e.g., Cunningham, 1979; and Rind, 1996) have implicitly suggested that customer state affect influences tipping behavior, none have explicitly demonstrated this effect. This study suggests that customer state affect does influence tipping behavior, such that customers in better moods tip better than those in worse moods. This finding provides a new, higher ordinate perspective that can serve to explain the findings of a host of previous studies examining tipping behavior.

Perhaps the most critical issue of this dissertation concerns examining whether emotional contagion exists, or if congruence has previously been erroneously assumed to be contagion. Marginal evidence exists supporting the presence of both contagion and congruence. More specifically, the relationship between customer state affect and server state affect approached significance, suggesting emotional congruence between servers and their customers. Furthermore, the marginal relationship between contagion-related variables (i.e., ECS, FES, ACT, and SAM) and customer state affect may suggest that contagion is the factor responsible for the demonstrated congruence. It is important to note that these represent marginal findings, and thus should be interpreted with caution.

Contrary to both this study's initial hypotheses, as well as previous research (e.g., Tidd & Lockard, 1978), this study suggests that it is never beneficial for servers to be expressive. In fact, at some restaurants, servers' self-reported levels of expressiveness (i.e., FES scores) negatively influenced customer affect. Because previous research has examined the influence of specific forms of expressiveness (e.g., Tidd & Lockard, 1978), this finding may suggest that the FES does not perform as Klein and Cacioppo (1994) previously anticipated. These results suggest both that restaurant management may benefit from examining levels of server expressivity prior to hiring their servers, and that

servers may benefit from being less emotionally expressive. At the very least, the restaurant industry would be well served to better understand the role of server emotional expressivity on customer mood states.

The relationship between customer state affect and their cognitive satisfaction ratings of food and service quality are intriguing. At least two competing hypotheses exist to account for these findings. First, perhaps these results are best explained as the result of cognitive priming. In other words, the fact that customers were asked to indicate their state affect immediately after rating their satisfaction with food and service quality may cause customers' self-reports of state affect to be systematically biased. According to this hypothesis, the relationship between customer state affect and their cognitive evaluations of their dining experience is a methodological artifact. However, Forgas's affect infusion model (AIM, 1995) provides a competing hypothesis. According to this hypothesis, affect infusion would cause the similarity between customers' state affect and their cognitive ratings The AIM (Forgas, 1995) suggests that affect is likely to influence cognitive and attitudinal processes both in situations where individuals are forced to effortfully process information, as well as in situations in which individuals are confronted with an object or situation toward which they have formed no previous attitudes. The validity of these two competing hypotheses could be addressed within an experimental methodology by merely modifying the outcome variables, such that customers are asked to indicate either their cognitive ratings of food and service quality, their state affect, or their cognitive ratings of food and service quality <u>as well as</u> their self-reports of state affect.

A central assumption of this study is that individual differences on contagion-related variables would moderate the incidence of emotional contagion. More

specifically, self-reported levels of emotional expressivity (i.e., ACT and FES scores) and emotional receptivity (i.e., ECS scores) would predict when contagion could be expected. Numerous methodological problems existed that may have obfuscated this effect. However, if individual differences in contagion-related variables do indeed influence the state affect of others, the effect is likely to be small in magnitude. At the very least, it appears as though viewing individual differences as the prime determinant of emotional contagion represents an overly simplified understanding of the contagion process. Future research needs to examine the interactions between individual differences in contagion related variables and a variety of contextual influences on the contagion effect.

Conclusion

Emotional contagion represents the crossroads between individual psychology and social psychology. A greater awareness of the likelihood and effects of this phenomenon may provide insights into interpersonal communication and behavior. Applications extend beyond the interactions of restaurant servers and their customers, to the political arena, the therapist's office, as well as within intimate relationships, and negotiations within business settings. These results were inconclusive regarding the likelihood and implications of contagion within an applied context. A greater body of both applied and laboratory research needs to be conducted before it is clear that emotional contagion provides a mechanism for the interpersonal transmission of emotions, thereby influencing the lens through which one interprets the many ambiguous stimuli in the environment.

APPENDIX A
CUSTOMER SATISFACTION SURVEY

On a 5 point scale, with F = poor, D = below average, C = average, B = good and A = excellent, how would you rate your food on:

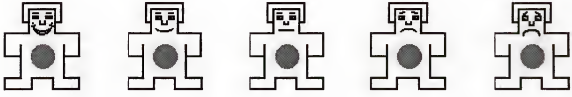
Appearance _____ Taste _____ Price _____

On a 5 point scale, with F = poor, D = below average, C = average, B = good and A = excellent, how would you rate your service on:

Promptness _____ Friendliness _____ Attentiveness _____

Do you have any suggestions that might improve your dining experience?

Please circle the figure that most accurately indicates how positive or negative you feel right now.



Please circle the figure that most accurately indicates how strongly you feel it.

APPENDIX B

WAIT STAFF DEMOGRAPHICS

What is your 8-digit personalized identification number? Remember, the first 4 digits consist of the last 4 digits of your social security number, whereas the last 4 digits consist of the month and year of your birthday.

___ ___ ___ ___	___ ___	___ ___
Last 4 Social Security digits	Birth Month (e.g., May = 05)	Birth Year (e.g., 1980 = 80)

What is your race? _____

What is your sex? M F

How many total years and months of waiting experience do you have (e.g., 2 years and 3 months)? _____ Years, _____ Months.

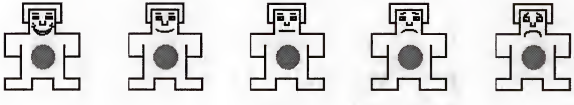
Total years and months of waiting experience at your current place of employment?

_____ Years, _____ Months.

APPENDIX C

SELF ASSESSMENT MANIKIN

Please circle the figure that most accurately indicates how positive or negative you feel right now.



Please circle the figure that most accurately indicates how strongly you feel it.

APPENDIX D

THE EMOTIONAL CONTAGION SCALE (ECS)

This measures your feelings and behaviors in various situations. There are no right or wrong answers, so try very hard to be completely honest in your answers. Results are *completely confidential*. Read each question very carefully. Thank you.

Use the following key:

A = Always true for me

O = Often true for me

S = Sometimes true for me

R = Rarely true for me

N = Never true for me

1._____If someone I'm talking to begins to cry, I get teary-eyed.

2._____Being with a happy person picks me up when I'm feeling down.

3._____When someone smiles warmly at me, I smile back and feel warm inside.

4._____I get filled with sorrow when people talk about the death of their loved ones.

5._____I clench my jaws and my shoulders get tight when I see the angry faces on the news.

6._____When I look into the eyes of the one I love, my mind is filled with thoughts of romance.

7._____It irritates me to be around angry people.

8._____Watching the fearful faces of victims on the news makes me try to imagine how they might be feeling.

9_____I melt when the one I love holds me close. 10_____I tense when overhearing an angry quarrel.

11_____Being around happy people fills my mind with happy thoughts.

12_____I sense my body responding when the one I love touches me.

13_____I notice myself getting tense when I'm around people who are stressed out.

14_____I cry at sad movies.

15_____Listening to the shrill screams of a terrified child in a dentist's waiting room makes me feel nervous.

APPENDIX E

THE FACIAL EXPRESSIVENESS SCALE (FES)

This measures your feelings and behaviors in various situations. There are no right or wrong answers, so try very hard to be completely honest in your answers. Results are *completely confidential*. Read each question very carefully. Please answer the following questions as accurately and honestly as possible. Thank you.

The following items should be rated on the following scale.

0	=	Not at all descriptive of me
1	=	Rarely descriptive of me
2	=	Occasionally descriptive of me
3	=	Regularly descriptive of me
4	=	Frequently descriptive of me
5	=	Very descriptive of me

1._____I can't help but let other people know when I'm glad to see them

2._____People can tell I have a problem from my expression

3._____I tend to touch friends during a conversation

4._____I laugh a lot

5._____People have told me I'm an expressive person

6._____I show that I like someone by hugging or touching that person

7._____I get excited easily

8._____People can tell from my facial expression how I am feeling

9._____When I am alone I can make myself laugh by remembering something from the past

10_____Watching television or reading a book can make me laugh aloud

APPENDIX F

THE AFFECTIVE COMMUNICATION TEST (ACT)

This measures your feelings and behaviors in various situations. There are no right or wrong answers, so try very hard to be completely honest in your answers. Results are *completely confidential*. Read each question very carefully. Please answer the following questions as accurately and honestly as possible. Thank you.

The following items should be rated on the following scale.

0	=	Not at all descriptive of me
1	=	Rarely descriptive of me
2	=	Occasionally descriptive of me
3	=	Regularly descriptive of me
4	=	Frequently descriptive of me
5	=	Very descriptive of me

1._____When I hear good music, I can hardly keep still

2._____My laugh is soft and subdued

3._____I can easily express emotion over the telephone

4._____I often touch friends during conversations

5._____I dislike being watched by a large group of people

6._____I usually have a neutral facial expression

7._____People tell me I would make a good actor or actress

8._____I like to remain unnoticed in a crowd

9._____I am shy among strangers

10_____I am able to give a seductive glance if I want to

11_____I am terrible at pantomime in games like charades

12_____At small parties I am the center of attention

13_____I show that I like someone by hugging or touching that person

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I certify that I have read this study and in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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I certify that I have read this study and in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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